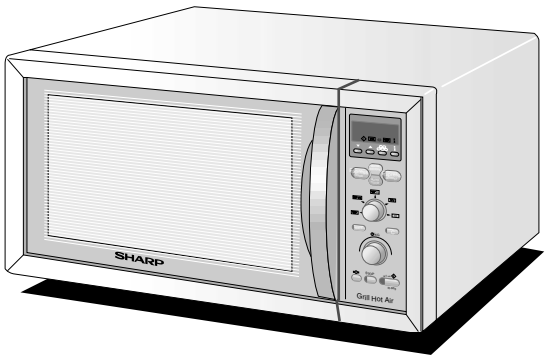
SHARP® SERVICE MANUAL

S07283R933EHW



MICROWAVE OVEN WITH GRILL AND CONVECTION

MODELS R-933(IN) R-933(W)

In interests of user-safety the oven should be restored to its original condition and only parts identical to those specified should be used.

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SHARP CORPORATION

CAUTION
MICROWAVE RADIATION

Personnel should not be exposed to the microwave energy which may radiate from the magnetron or other microwave generating devices if it is improperly used or connected. All input and output microwave connections, waveguides, flanges and gaskets must be secured.
Never operate the device without a microwave energy absorbing load attached.
Never look into an open waveguide or antenna while the device is energized.

VARNING
MICKROVAGSSTRALING

Personal får inte utsättas för mikrovågsenergi som kan ustrala från magnetronen eller andre mikrovågsalstrande anordningar om dessa är felanslutna eller används på fel sätt. Alla in-och utgångsanslutningar för mikrovågor, vagledare, flänsar och packningar måste vara fast anslutna.
Mikrovågsgeneratorn får inte arbeta utan att absorberande belastning är ansluten. Titta aldrig in i ën öppen vågledare eller antenn när mikrovågsgeneratorn är påkopplad eller laddad.

VAROITUS
MIKROAALTOSÄTELYÄ

Käyttäjä ei saa joutua alttiiksi mikroaaltoenergialle, jota voi säteillä magnetronista tai muusta mikroaaltoja kehittävästä laitteesta, jos sitä käytetään tai jos se kytketään väärin. Kaikkien mikroaaltoliitäntöjen sekä syöttö-että ulostulopuolella, aaltoputkien laippojen ja tiivisteiden tulee olla varmistettuja.
Mikroaaltouunnia ei koskaan saa käyttää ilman kuormaa jossa mikroaaltoenergiaa kuluu. Avoimeen aaltoputkeen tai antenniin ei koskaan saa katsoa virran ollessa kytkettynä.

ADVARSEL
MIKROBØLGESTRÅLING

Personell må ikke utsettes for mikrobølge-energi som kan utståles fra magnetronen eller andre mikrobølge-generende deler dersom apparatet feilbetjenes eller blir feiltikoplet. Alle inn-og ut-tilkoplinger i forbindelse med mikrobølge-strålingen, bølgeledere, flenser og tetningsringer/pakninger må festes ordentlig.
Aldri bruk apparatet med mindre en mikrobålge-absorberende last er plassert i ovnsrommet.
Aldri se direkte inn i en åpen bølgeleder eller antenne imens apparatet er strømførende.

ADVARSEL
MIKROBØLGEBESTRÄLING

Man bør ikke udsætte sig for mikrobølgebestråling fra magnetronen eller andre mikrobølgefrembringende anordninger, hvilket kan ske hvis apparatet er forkert tilsluttet eller bruges forkert. Alle mikrobølgeindgange og-udgange, bølgeledere, flanger og tætningsstrimler må være forsvarligt udført.
Anvend aldrig ovnen uden en mikrobølgesabsorberende anordning. Se aldrig ind i en åben bølgeleder eller antenne, mens ovnen er i brug.

SERVICE MANUAL

SHARP

GRILL AND CONVECTION MICROWAVE OVEN

R-933(IN)/ R-933(W)

GENERAL IMPORTANT INFORMATION

This Manual has been prepared to provide Sharp Corp. Service engineers with Operation and Service Information.

It is recommended that service engineers carefully study the entire text of this manual, so they will be qualified to render satisfactory customer service.

CAUTION
MICROWAVE RADIATION
DO NOT BECOME EXPOSED TO RADIATION FROM THE MICROWAVE GENERATOR OR OTHER PARTS THAT CONDUCT MICROWAVE ENERGY.

WARNING

Note:	The parts marked "*" are used in voltage more than 250V. (Parts List)
Anm:	Delar märket med "*" har en spänning överstigande 250V.
Huom:	Huolto-ohjeeseen merkitty "tähdella" osat joissa jännite on yli 250 V.
Bemerk:	Deler som er merket "asterisk" er utsatt for spenninger over 250V til jord.
Bemærk:	"Dele mærket med stjerne benyttes med højere spænding end 250 volt.

WARNING

Never operate the oven until the following points are ensured.
(A) The door is tightly closed.
(B) The door brackets and hinges are not defective.
(C) The door packing is not damaged.
(D) The door is not deformed or warped.
(E) There is not any other visible damage with the oven.

Servicing and repair work must be carried out only by trained service engineers.

All the parts marked "*" on parts list are used at voltage more than 250V.

Removal of the outer wrap gives access to potential above 250V.

All the parts marked "Δ" on the parts list may cause undue microwave exposure, by themselves, or when they are damaged, loosened or removed.

SHARP CORPORATION

OSAKA, JAPAN

SERVICING

WARNING TO SERVICE PERSONNEL

(GB) Microwave ovens contain circuitry capable of producing very high voltage and current, contact with following parts will result in electrocution.
High voltage capacitor, High voltage transformer, Magnetron, High voltage rectifier assembly, High voltage harness.

REMEMBER TO CHECK 3D

1) Disconnect the supply.
2) Door opened, and wedged open.
3) Discharge high voltage capacitor.

WARNING: AGAINST THE CHARGE OF THE HIGH-VOLTAGE CAPACITOR
The high-voltage capacitor remains charged about 60 seconds after the oven has been switched off. Wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is, of the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

Sharp recommend that wherever possible fault-finding is carried out with the supply disconnected. It may in, some cases, be necessary to connect the supply after the outer case has been removed, in this event carry out 3D checks and then disconnect the leads to the primary of the High voltage transformer. Ensure that these leads remain isolated from other components and the oven chassis. (Use insulation tape if necessary.) When the testing is completed carry out 3D checks and reconnect the leads to the primary of the High voltage transformer.

REMEMBER TO CHECK 4R

1) Reconnect all leads removed from components during testing.
2) Replace the outer case (cabinet).
3) Reconnect the supply.
4) Run the oven. Check all functions.

Microwave ovens should not be run empty. To test for the presence of microwave energy within a cavity, place a cup of cold water on the oven turntable, close the door and set the power to HIGH and set the microwave timer for two (2) minutes. When the two minutes has elapsed (timer at zero) carefully check that the water is now hot. If the water remains cold carry out 3D checks and re-examine the connections to the component being tested.

When all service work is completed, and the oven is fully assembled, the microwave power output should be checked and a microwave leakage test should be carried out.

(NL) Magnetronovens bevatten circuits die een zeer hoge spanning en stroom kunnen voortbrengen. Contact met de volgende onderdelen kan elektrocutie tot gevolg hebben.
Hoogspanningscondensator, hoogspanningstransformator, magnetron, hoogspanningsgelijkrichter, hoogspannings kabelboom.

VERGEET DE VOLGENDE 3 STAPPEN NIET

1) Haal de stekker uit het stopcontact.
2) Open de deur en zorg ervoor dat hij niet dicht kan vallen.
3) Ontlaad de hoogspanningscondensator.

PAS OP VOOR DE ELECTRISCHE LADING VAN DE HOOGSPANNINGSCONDENSATOR
De hoogspanningscondensator blijft nog ongeveer 60 seconden lang opgeladen, nadat de oven is uitgeschakeld. Wacht 60 seconden voordat u de verbinding van de hoogspannings-condensator (m.a.w. de verbindingsdraad van de hoogspanningsgelijkrichter) met een geïsoleerde schroevedraaier kortsluit tegen het chassis.

Sharp beveelt ten sterkste aan dat, voor zover mogelijk, defecten worden opgespoord wanneer de stekker uit het stopcontact is gehaald. Soms is het nodig om de stroomtoevoer weer tot stand te brengen nadat de buitenmantel verwijderd is. Herhaal dan de bovengenoemde 3 stappen en haal de electrische draden uit de primaire zijde van de vermogenstransformator. Zorg ervoor dat deze draden geïsoleerd blijven van andere elementen en van het chassis van de oven. (Gebruik zo nodig isolatieband.) Wanneer de test is uitgevoerd, herhaalt u de bovenstaande 3 stappen en verbindt u de electrische draden weer aan de primaire zijde van de vermogenstransformator.

VERGEET DE VOLGENDE 4 STAPPEN NIET

1) Sluit de draden weer aan diezijn losgehaald voor de test.
2) Plaats de buitenmantel weer om het toestel heen (kabinet).
3) Stop de stekker weer in het stopcontact.
4) Zet de oven aan. Controleer alle functies.

Magnetronovens mogen niet leeg aangezet worden. Om te controleren of er microgolf-energie binnen de oven wordt geproduceerd, plaatst u een mok met koud water op de draaitafel van de oven, sluit de deur, zet de oven op HIGH en stelt de klok van de magnetron in op twee (2) minuten. Wanneer de twee minuten voorbij zijn (klok staat op nul), controleert u voorzichtig of het water heet is. Indien het water nog steeds koud is, herhaalt u de allereerste drie stappen en controleer nogmaals de aansluitingen naar de geteste onderdelen.

Wanneer alle reparaties zijn uitgevoerd en de oven weer in elkaar is gezet, moet de het magnetronvermogen worden gecontroleerd en moet worden gecontroleerd of er geen microgolflekkage is.

SERVICING

(E) Los hornos de microondas contienen circuitos eléctricos capaces de producir voltajes de alta tensión y descargas eléctricas. Para evitar el riesgo de electrocución, absténgase de tocar los siguientes componentes: condensador de alta tensión, transformador de alta tensión, magnetrón, dispositivo del rectificador de alta tensión y arnés de alta tensión.

RECUERDE LA COMPROBACION 3D

1) Desconecte la alimentación.
2) Deje la puerta abierta y calzada.
3) Descargue el condensador de alto voltaje.

ADVERTENCIA SOBRE LA CARGA DEL CONDENSADOR DE ALTO VOLTAJE
El condensador de alto voltaje permanece cargado unos 60 segundos después de haber apagado el horno. Espere 60 segundos y luego ponga en cortocircuito la conexión del condensador de alto voltaje (esto es, del conductor de conexión del rectificador de alto voltaje) al chasis con un destornillador de mango aislado.

Se recomienda encarecidamente que siempre que sea posible la localización de fallos se realice con la alimentación desconectada. Puede ser que en algunos casos sea necesario conectar la alimentación después de haber retirado la carcasa exterior. En este caso, realice las comprobaciones 3D y luego desconecte los conductores del primario del transformador de alimentación. Asegúrese de que estos conductores permanezcan aislados de otros componentes y del chasis del horno. (Use cinta aislante si es necesario). Cuando termine la prueba efectúe las comprobaciones 3D y reconecte los conductores al primario del transformador de alimentación.

RECUERDE LA COMPROBACION 4C

1) Conecte todos los componentes desconectados de los componentes durante la prueba.
2) Coloque la carcasa exterior (cabina).
3) Conecte la alimentación.
4) Compruebe todas sus funciones despues de poner en marcha el horno.

Los hornos de microondas no deben funcionar vacíos. Para comprobar la presencia de energía de microondas dentro de una cavidad, coloque una taza de agua fría en el plato giratorio del horno, cierre la puerta y ponga la potencia en HIGH (alta) y coloque el temporizador en dos (2) minutos. Cuando transcurran los dos minutos (temporizador a cero) compruebe cuidadosamente que el agua se ha calentado. Si el agua permaneciese fría, efectúe las comprobaciones 3D y vuelva a examinar las conexiones de los componentes que han sido probados.

Cuando haya terminado la intervención en el equipo y el horno haya sido ensamblado de nuevo completamente, deberá comprobar la potencia de salida de microondas y realizar una prueba de fugas de microondas.

(SV) Mikrovågsugnar innehåller kretsar som producerar mycket höga spänningar och strömmar.
Kontakt med följande komponenter kan leda till dödsfall:
Högspänningskondensator, transformator, magnetron, högspännings likriktare, högspännings kablage.

KOM IHÅG ATT KONTROLLERA 3 STEG

1) Koppla från strömkällan.
2) Öppna dörren på glänt.
3) Ladda ur högspänningskondensatorn.

VARNING FÖR LADDNINGEN I HÖGSPÄNNINGSKONDENSATORN
Högspänningskondensatorn är laddad i 60 sekunder efter det att ugnen stängts av. Vänta 60 sekunder och korislut sedan kondensatoms anslutning (dvs anslutningen till högspänningslikriktaren) till chassiet med hjälp av en isolerad skruvmejsel.

Sharp rekommenderar att felsökning sker med strömmen frånkopplad. Ibland kan det var nödvändigt att koppla på strömmen efter det att höljet avlägsnats, utför da 3 Steg kontrollen och koppla sedan från ledarna till transformatorns primärsida. Se till att ledarna är isolerade från andra komponenter och chassiet. (Använd isoleringsband om det behövs). När Du testat färdigt utför Du 3 Steg kontrollen och ansluter ledningarna till transformatorns primärsida igen.

KOM IHÅG ATT KONTROLLERA 4 STEG

1) Anslut alla ledningar som använts vid testning
2) Sätt tillbaka ytterhöljet.
3) Anslut strömkällan på nytt.
4) Sätt på ugnen. Kontrollera alla funktioner.

Mikrovågsugnar får inte användas tomma. Kontrollera mikrovågsstrålningen i olika delar av ugnen genom att placera en kopp med kallt vatten på ugnens tallrik, stäng dörren, ställ in HIGH och ställ in 2 minuter på timern. När två minuter har gått (timem visar 0) kontrollerar du om vattnet är varmt. Om vattnet fortfarande är kallt utför Du 3 steg kontroller och kontrollerar anslutningarna till varje enskild komponent på nytt.

När all service är klar och ugnen ihopskruvad skall ugnens uteffekt och eventuellt mikrovågsläckage kontrolleras.

SERVICING

(I) I forni a microonde contengono un circuito elettrico in grado di generare tensioni e correnti estremamente elevate. L'eventuale contatto con i seguenti componenti può causare la folgorazione:
condensatore ad alta tensione; trasformatore ad alta tensione; magnetron; rettificatore alta tensione; cablaggio ad alta tensione.

TRE OPERAZIONI IMPORTANTI PER INCOMINCIARE

1) Scollegare l'alimentazione elettrica.
2) Verificare che la porta sia bloccata in posizione aperta.
3) Scaricare il condensatore ad alta tensione.

ATTENZIONE AL CONDENSATORE AD ALTA TENSIONE: PUO ESSERE CARICO
Il condensatore ad alta tensione rimane carico per circa 60 secondi dopo lo spegnimento del forno. Occorre quindi spettare 60 secondi prima di cortocircuitare, utilizzando un cacciavite con impugnatura isolata, il collegamento del condensatore ad alta tensione (cioè del conduttore di collegamento del raddrizzatore ad alta tensione) sul telaio del forno.

Sharp raccomanda, nei limiti del possibile, che la ricerca dei guasti avvenga in assenza di alimentazione elettrica. In alcuni casi tuttavia, può essere necessario alimentare l'apparecchio dopo aver rimosso la scatola esterna. In questo caso eseguire i tre controlli sopra citati e quindi scollegare i connettori dal primario del trasformatore. Assicurarsi che tali connettori non vengano a contatto con altri componenti, ne con il telaio del forno (fare uso, se necessario, di nastro isolante). Al termine dell'intervento, eseguire nuovamente i tre controlli e ricollegare i conduttori al primario del trasformatore.

QUATTRO VERIFICHE IMPORTANTI DA NON DIMENTICARE

1) Ricollegare tutti i conduttori staccati dai vari componenti durante l'intervento.
2) Rimontare la scatola esterna.
3) Ripristinare l'alimentazione elettrica.
4) Rimettere in funzione il forno. Controllare tutte le funzioni.

I forni a microonde non devono mai funzionare a vuoto. Per verificare la presenza di energia da microonde all'interno di una cavitá, mettere una tazza di acqua fredda sul piatto rotante del forno, chiudere la porta, regolare la potenza su HIGH ed impostate il temporizzatore su due (2) minuti. Trascorsi i due minuti (temporizzatore a zero), controllare accuratamente che ora l'acqua sia calda. Se l'acqua è rimasta fredda, eseguire i tre controlli iniziali e verificare nuovamente i collegamenti del componente in questione.

Dopo aver portato a termine le operazioni di manutenzione e rimontato il forno, è necessario controllare la potenza delle microonde emesse ed eseguire un test per verificare che non vi sia alcuna dispersione.

PRODUCT DESCRIPTION

SPECIFICATION

ITEM	DESCRIPTION
Power Requirements	230 Volts / 50 Hertz / Single phase, 3 wire earthed
Power Consumption	Microwave cooking 1.5 kW Approx. 6.7 A
	Convection cooking 2.65 kW Approx. 11.5 A
	Grill cooking 2.65 kW Approx. 11.5 A
	Dual cooking Micro and Grill ..... 2.8 kW Approx. 12.4 A Micro and Convection..... 2.8 kW Approx. 12.4 A
Power Output	900 W nominal of RF microwave energy (measured by method of IEC 60705) Operating fequency 2450 MHz
Grill heating element Power Output	1300 W (650 W x 2)
Convection heating element Power Output	1300 W
Case Dimensions	Width 550 mm Height 368 mm (including foot) Depth 537 mm
Cooking Cavity Dimensions	Width 375 mm Height 272 mm Depth 395 mm
Turntable diameter	362mm
Control Complement	Touch Control System Clock (1:00 - 12:59 or 0:00 - 23:59) / Timer (0 - 90 minutes) Microwave Power for Variable Cooking Repetition Rate; HIGH ..... Full power throughout the cooking time MEDIUM HIGH ..... approx. 70% of FULL Power MEDIUM ..... approx. 50% of FULL Power MEDIUM LOW ..... approx. 30% of FULL Power LOW ..... approx. 10% of FULL Power Convection temperature control range: 250˚C, 230˚C, 220˚C, 200˚C, 180˚C, 160˚C, 130˚C, 100˚C, 70˚C and 40˚C LESS(▼)/ MORE(▲) buttons, LANGUAGE button INFORMATION button, EXPRESS COOK button EXPRESS DEFROST button, AUTO REHEAT button AUTO COOK button, COOKING MODE dial, CONVECTION button MICROWAVE POWER LEVEL button, TIME/WEIGHT dial CLOCK setting button, STOP button, + 1min◇/ START button
Net Weight	Approx. 23 kg

GENERAL INFORMATION

WARNING

THIS APPLIANCE MUST BE EARTHED

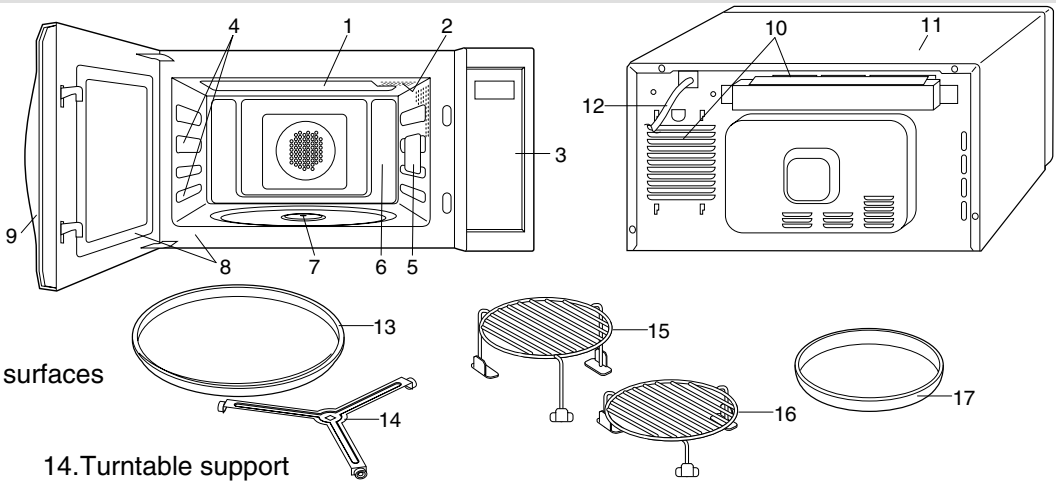
IMPORTANT

THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE:

GREEN-AND-YELLOW	: EARTH
BLUE	: NEUTRAL
BROWN	: LIVE

As part of our policy of continuous improvement, we reserve the right to alter design and specifications without notice

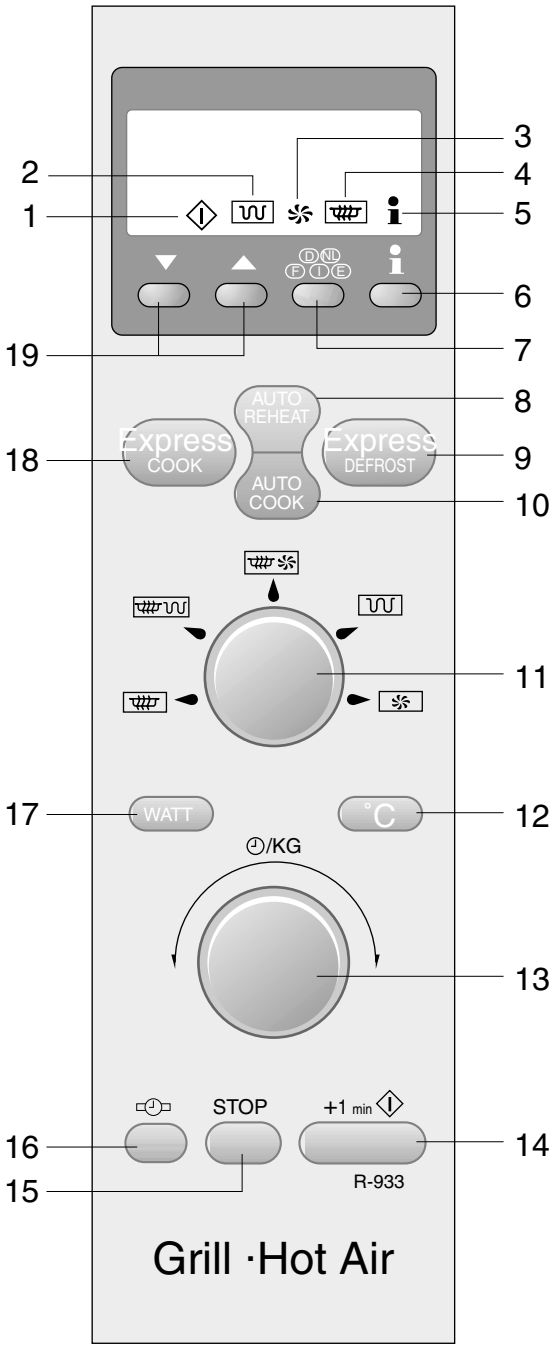
APPEARANCE VIEW



OVEN

1. Grill heating element
2. Oven lamp
3. Control panel
4. Shelf runners
5. Waveguide cover
6. Oven cavity
7. Coupling
8. Door seals and sealing surfaces
9. Door opening handle
10. Air-vent openings
11. Outer cabinet
12. Power cord
13. Turntable
14. Turntable support
15. High Rack
16. Low Rack
17. Baking tin

CONTROL PANEL



Digital display and indicators:

1. **COOKING IN PROCESS** indicator
2. **GRIL** indicator
3. **CONVECTION** indicator
4. **MICROWAVE** indicator
5. **INFO** indicator

Operating buttons:

6. **INFORMATION** button
7. **LANGUAGE** button
8. **AUTO REHEAT** button
9. **EXPRESS DEFROST** button
10. **AUTO COOK** button
11. **COOKING MODE** dial

    Rotate the dial so that indicator points to appropriate symbol.

    for microwave cooking

    for microwave cooking with GRILL

    for microwave cooking with CONVECTION

    for GRILL

    for CONVECTION
12. **CONVECTION** buttonbutton

    Press to change the convection temperature.
13. **TIME/WEIGHT** knob

    Rotate the knob to enter either the cooking/defrosting time or weight food.
14. **1 min / START** button (See note)

    NOTE:

    This features is disabled after three minutes when the oven is not in use. This feature is automatically enabled when the door is opened and closed or the STOP button is pressed.
15. **STOP** button
16. **CLOCK SETTING** button
17. **MICROWAVE POWER LEVEL** button

    Press to change the microwave power setting.
18. **EXPRESS COOK** button
19. **LESS / MORE** buttons

OPERATION SEQUENCE

OFF CONDITION

Closing the door activates the monitored latch switch and the stop switch.

IMPORTANT:

When the oven door is closed, the contacts COM-NC of the monitor switch must be open. When the microwave oven is plugged in a wall outlet (230V / 50Hz), the line voltage is supplied to the noise filter.

Figure O-1 on page 33

1. The control unit is not energized. The display shows nothing (Fig. O-1 (a)).
2. Open the door. The contacts (COM-NC) of the monitored latch switch are closed and the control unit is energized. Then contacts of relays RY1 and RY5 are closed, and the oven lamp will light and the display will show "SELECT LANGUAGE" in 5 languages. (Fig. O-1(b)).

NOTE: Once the language is selected using the LANGUAGE button, the display will show "ENERGY SAVE MODE TO GO OUT OF ENERGY SAVE MODE SET CLOCK" when the oven is plugged in.

3. Close the door. The contacts (COM-NC) of the monitored latch switch are opened and the contacts of relay RY1 are opened and the oven lamp will be turned off. The display will show " . 0". (Fig. O-1(c)).

NOTE: Energy save mode

1. If the oven has not been used for more than 3 minutes, the contacts of the relay RY5 will be opened and the control unit will be not energized. Open and close the door, the control unit will resume.
2. If the clock is set, this energy save mode does not work.
3. If the display shows different messages from **ENERGY SAVE MODE,** the oven may be set in demo mode. Close the door, see operation manual to cancel demo mode.

MICROWAVE COOKING CONDITION

HIGH COOKING

Rotate the COOKING MODE dial to the micro setting. And press the POWER LEVEL button once. And enter the cooking time by rotating the TIME/WEIGHT dial. And start the oven by pressing START button.

Function sequence Figure O-2 on page 34

CONNECTED COMPONENTS	RELAY
Oven lamp, Turntable motor	RY1
High voltage transformer	RY2
Fan motor	RY6

1. The line voltage is supplied to the primary winding of the high voltage transformer. The voltage is converted to about 3.3 volts A.C. output on the filament winding and high voltage of approximately 2000 volts A.C. on the secondary winding.
2. The filament winding voltage (3.3 volts) heats the magnetron filament and the high voltage (2000 volts) is sent to the voltage doubling circuit, where it is doubled to negative voltage of approximately 4000 volts D.C..
3. The 2450 MHz microwave energy produced in the magnetron generates a wavelength of 12.24 cm. This energy is channelled through the waveguide (transport channel) into the oven cavity, where the food is placed to be cooked.
4. When the cooking time is up, a signal tone is heard and the relays RY1 + RY2 + RY6 go back to their home position. The circuits to the oven lamp, high voltage transformer, fan motor and turntable motor are cut off.
5. When the oven door is opened during a cooking cycle, the switches come to the following condition.

Switch	Contact	Condition	
		During Cooking	Oven Door Open(No cooking)
Monitored latch switch	COM-NO	Closed	Opened
	COM-NC	Opened	Closed
Stop switch	COM-NO	Closed	Opened
Monitor Switch	COM-NO	Closed	Opened
	COM-NC	Opened	Closed

The circuit to the high voltage transformer is cut off when the contacts of relay RY2, and the contacts (COM-NO) of the monitored latch switch SW1 and monitor switch SW3 are made open. The circuit to the fan motor is cut off when the relay RY6 is made open. The circuit to the turntable motor is cut off when the contacts (COM-NO) of the monitored latch switch SW1 are made open. The oven lamp remains on even if the oven door is opened after the cooking cycle has been interrupted, because the relay RY1 stays closed. Shown in the display is remaining time.

6. MONITOR SWITCH CIRCUIT
   The monitor switch SW3 is mechanically controlled by the oven door, and monitors the operation of the monitored latch switch SW1.

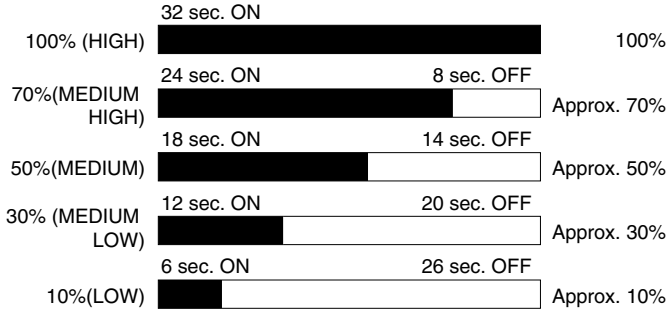
6-1. When the oven door is opened during or after the cycle of a cooking program, the monitored latch switch SW1 and stop switch SW2 must open their contacts (COM-NO) first. And the contacts (COM-NC) of the monitored latch switch SW1 are made closed. After that the contacts (COM-NC) of the monitor switch SW3 can be closed and the contacts (COM-NO) of monitor switch SW3 are made open.

6-2. When the oven door is closed, the contacts (COM-NC) of the monitor switch SW3 must be opened and the contacts (COM-NO) of monitor switch SW3 must be closed. After that the contacts (COM-NO) of the monitored latch switch SW1 and the stop switch SW2 are made closed. And the contacts (COM-NC) of the monitored latch switch SW1 are made open.

6-3. When the oven door is opened and the contacts (COM-NO) of the monitored latch switch SW1 remain closed, the fuse F2 F8A will blow. Because the relay RY1 and monitor switch SW3 are closed and a short circuit is caused.

MEDIUM HIGH, MEDIUM, MEDIUM LOW, LOW COOKING

When the microwave oven is preset for variable cooking power, the line voltage is supplied to the high voltage transformer intermittently within a 32-second time base through the relay contact which is coupled with the current-limiting relay RY2. The following levels of microwave power are given.



Note: The On/Off time ratio does not exactly correspond to the percentage of microwave power, because approx. 3 seconds are needed for heating up the magnetron filament.

GRILL COOKING CONDITION

TOP GRILL (Figure O-3a)

In this condition the food is cooked by the top grill heating element . Rotate the COOKING MODE dial to GRILL setting. And enter the desired cooking time by rotating the TIME/WEIGHT dial. When the START button is pressed, the following operations occur:

1. The numbers on the digital readout start the count down to zero.
2. The oven lamp, cooling fan motor and turntable motor are energized.
3. The relay RY3 is energized and the main supply voltage is applied to the top grill heating elements.
4. Now, the food is cooked by the top grill heating elements.

NOTE: The convection cooking condition will be carried out simultaneously until the temperature of the oven cavity rise to 220˚C.

CONVECTION COOKING CONDITION

PRE-HEATING (by 40˚C - 130˚C)

Rotate the COOKING MODE dial to the convection setting. And programme the desired convection temperature of 40˚C - 130˚C by touching CONVECTION button. When the START button is touched, the following operations occur:

1. The relays RY1, RY6 and RY7 are energized, the oven lamp, turntable motor, fan motor and convection motor are turned on.
2. The relay RY4 is energized and the main supply voltage is applied to the convection heating element.
3. After the temperature of oven cavity rises to the selected one, the oven will continue to turned the convection heating element on and off to maintain the temperature for 30 minutes.

PRE-HEATING (by 160˚C – 250˚C)

Rotate the COOKING MODE dial to the convection setting. And programme the desired convection temperature of 160˚C - 250˚C by touching CONVECTION button. When the START button is touched, the following operations occur:

1. The relays RY1, RY6 and RY7 are energized, the oven lamp, turntable motor, fan motor and convection motor are turned on.
2. The relay RY4 and RY3 are is energized and the main supply voltage is applied to the convection heating element and the grill heating elements.
3. After the temperature of oven cavity rises to the selected one, the oven will continue to turned the convection heating element on and off to maintain the temperature for 30 minutes. And simultaneously the grill heating element will be operated at 10% power output.

CONVECTION COOKING (by 250˚C)

Rotate the COOKING MODE dial to the convection setting. And enter the cooking time by rotating the TIME/WEIGHT dial. And select the desired cooking temperature 250˚C by pressing the CONVECTION button. When the START button is pressed, the following operations occur:

1. The relays RY1, RY6 and RY7 are energized, the oven lamp, turntable motor, fan motor and convection motor are turned on.
2. The relay RY4 and RY3 are energized and the main supply voltage is applied to the convection heating element and the grill heating element.
3. The oven will continue to turn the convection heating element on and off to maintain the temperature for the programmed cooking time. And simultaneously the grill heating elements will be operated at 10% power output.

CONVECTION COOKING (by 40˚C – 230˚C)

Rotate the COOKING MODE dial to the convection setting. And enter the cooking time by rotating the TIME/WEIGHT dial. And select the desired cooking temperature 40˚C - 230˚C by pressing the CONVECTION button. When the START button is pressed, the following operations occur:

1. The relays RY1, RY6 and RY7 are energized, the oven lamp, turntable motor, fan motor and convection motor are turned on.
2. The relay RY4 is energized and the main supply voltage is applied to the convection heating element.
3. The oven will continue to turned the convection heating element on and off to maintain the temperature for the programmed cooking time.

DUAL COOKING CONDITION

MICROWAVE AND CONVECTION (Figure O-5a)

Rotate the COOKING MODE dial to DUAL 1 setting. And enter the desired cooking time by rotating the TIME/WEIGHT dial. And press POWER LEVEL button to set the desired microwave power. And press the CONVECTION button to set the cooking temperature. When the START button is pressed, the following operations occur:

NOTE: The 100% microwave power level can not be selected.

When the START button is touched, the following operations occur:

1. The numbers on the digital read-out start the count down to zero.
2. The oven lamp, fan motor, turntable motor and convection motor are energized.
3. The relay RY4 will be energized and the main supply voltage is applied to the convection heating element.
4. The relay RY2 is energized and the microwave energy is generated by magnetron.
5. Now, the food is cooked by microwave and convection energy simultaneously.

MICROWAVE AND TOP GRILL (Figure O-5b)

Rotate the COOKING MODE dial to DUAL 2 setting. And enter the desired cooking time by rotating the TIME/WEIGHT dial. And press POWER LEVEL button to set the desired microwave power. When the START button is pressed, the following operations occur:

1. The numbers on the digital read-out start the count

down to zero.
2. The oven lamp, fan motor and turntable motor are energized.
3. The relay RY3 is energized and the main supply voltage is applied to the grill heating elements.
4. The relay RY2 is energized and the microwave energy is generated by magnetron.
5. Now, the food is cooked by microwave and grill simultaneously.

ON/OFF TIME RATIO

In dual cooking, the magnetron operate within a 48 second time base. The following table is the ON / OFF time ratio at each power output of the magnetron.

POWER OUTPUT	ON TIME	OFF TIME
100%	48 sec.	0 sec.
70%	36 sec.	12 sec.
50%	26 sec.	22 sec.
30%	16 sec.	32 sec.
10%	8 sec.	40 sec.

AUTOMATIC COOKING

Auto Cook functions automatically work out the correct cooking mode and cooking time and/or cooking temperature. They will cook according to the special cooking sequence.

POWER OUTPUT REDUCTION

After the same cooking mode is carried out for more than the basis cooking time, the power output is automatically reduced by turning the control relays on and off intermittently, as shown in the table below. This is to protect the oven door against temperature rising.

Cooking mode		Basis cooking time (minutes)	Reduced power output (%)	Time base (seconds)
Microwave (100%)		20	70	32
Grill		15	70	48
Convection		No reduction		
DUAL	Micro. (70%)	40 (Micro.)	50	48
	+ Grill	15 (Grill)	50	48
	Micro. (100%)	15 (Micro.)	50	48
	+ Grill	15 (Grill)	50	48
	Micro. (70%)	40 (Micro.)	50	48
	+ Conv.	No reduction		

NOTE:
1. If the multiple sequence cooking is carried out in the same mode, the basis cooking time is calculated from the first.
2. Even if the cooking is stopped by the STOP button or opening the door, the basis cooking time is calculated from the first.
3. If the same cooking mode is repeated within 1 minute and 15 seconds, the basis cooking time is calculated from the first.
4. If the same menu of automatic cooking is repeated within 1 minute and 15 seconds, the power output of the microwave or the grill will be reduced to 70% after 20 minutes when the oven is started at first.

FAN MOTOR OPERATION (in Grill, Convection and Dual mode)

When oven is stopped during cooking, or after the cooking is completed, the fan motor will operate if the oven cavity temperature is above 120˚C, and the fan motor will stop if the oven cavity temperature is below 105˚C.

CONVECTION MOTOR OPERATION

If the temperature of oven cavity is higher than 120˚C after and when operated by 250˚C convection cooking, 250˚C dual convection cooking or 250˚C preheating, the convection motor will operate for maximum 1 minute until the oven cavity temperature drops below 105˚C.

ON/OFF TIME RATIO

In grill cooking, convection cooking or dual cooking, the top heater, bottom heater or magnetron operate within a 48 second time base. The following table is the ON / OFF time ratio at each power output of the top heaters, bottom heater or magnetron.

FUNCTION OF IMPORTANT COMPONENTS

DOOR OPEN MECHANISM

The door can be opened by puiiing the door handle. When the door handle is pulled, the latch head is moved upward, and released from the latch hook now the door can be opened.

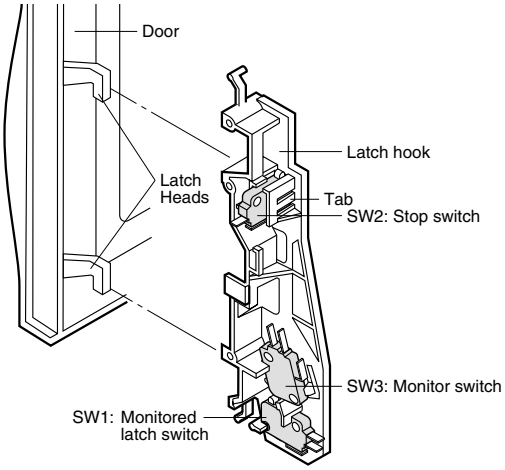


Figure D-1. Door Open Mechanism

MONITORED LATCH SWITCH SW1

1. When the oven door is closed, the contacts (COM-NO) of the switch must be closed. And the contacts (COM-NC) must be opened.
2. When the oven door is opened, the contacts (COM-NO) of the switch must be opened. And the contacts (COM-NC) must be closed.

STOP SWITCH SW2

1. When the oven door is closed, the contacts (COM-NO) of the switch must be closed.
2. When the oven door is opened, the contacts (COM-NO) of switch must be opened.

MONITOR SWITCH SW3

The monitor switch is activated (the contacts opened) by the upper latch head on the door while the door is closed. The switch is intended to render the oven inoperative by means of blowing the fuse F2 F8A when the contacts of the monitored latch switch SW1 fail to open when the door is opened.

Function

1. When the door is opened, the contacts (COM-NC) of monitor switch SW3 close (to the ON condition) due to their being normally closed and contacts (COM-NO) open. At this time the contacts (COM-NO) of monitored latch switch SW1 is in the OFF condition (contacts open) due to their being normally open contact switches.
2. As the door goes to a closed position, the monitor switch SW3 contacts (COM-NC) are opened and contacts (COM-NO) closed and then contacts (COM-NO) of monitored latch switch SW1 and stop switch SW2 are closed.(On opening the door, each of these switches operate inversely.)
3. If the door is opened and the monitored latch switch SW1 contacts (COM-NO) fail to open, the fuse F2 (F8A) blows immediately after closing of the monitor switch SW3 (COM-NC) contacts.

CAUTION: BEFORE REPLACING A BLOWN FUSE F2 F8A, TEST THE MONITORED LATCH SWITCH SW1 AND MONITOR SWITCH SW3 FOR PROPER OPERATION. (REFER TO CHAPTER “TEST PROCEDURE”).

FUSE F1 20A 250V

If the wire harness or electrical components are short-circuited, this fuse F1 20A blows to prevent an electric shock of fire hazard.

FUSE F2 F8A 250V

1. If the wire harness or electrical components are short-circuited, this fuse blows to prevent an electric shock or fire hazard.
2. The fuse also blows when the monitored latch switch SW1 remains closed with the oven door open and when the monitor switch SW3 contact (COM-NC) closes.
3. The fuse also blows when the asymmetric rectifier, H.V. rectifier,.H.V. wire harness, H.V. capacitor, magnetron or secondary winding of high voltage transformer is shorted.

TC TRANSFORMER

T/C transformer converts A.C. line voltage into low voltage to drive the control unit.

THERMAL CUT-OUT TC1 125˚C (MG)

This thermal cut-out protects the magnetron against overheat. If the temperature goes up higher than 125˚C because the fan motor is interrupted or the ventilation openings are blocked, the thermal cut-out TC1 will open and switch off all the electrical parts. The defective thermal cut-out must be replaced with a new one.

THERMAL CUT-OUT TC2 170˚C (GRILL)

This thermal cut-out protects the oven against the overheat during grill cooking, convection cooking or dual cooking. If the temperature rises above 170˚C because the fan motor is interrupted, the air inlet duct is blocked or the ventilation openings are obstructed, the thermal cut-out TC2 opens and switches off all the electrical parts. When the cools itself down to the operating temperature of 155˚C, the contacts of the thermal cut-out will close again.

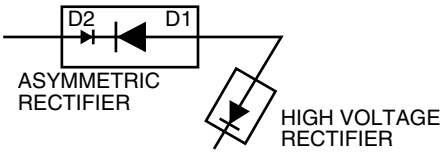
THERMAL CUT-OUT TC3 170˚C (CONV.)

This thermal cut-out protects the convection motor against the overheat. If the temperature of the thermal cut-out TC3 rises above 170˚C because the convection fan is interrupted, the ventilation openings are obstructed or the other abnormal matter occurs, the thermal cut-out opens and switches off the convection heating element and the other electrical parts. When the cools itself down to the operating temperature of 155˚C, the contacts of the thermal cut-out will close again.

FUNCTION OF IMPORTANT COMPONENTS

ASYMMETRIC RECTIFIER

The asymmetric rectifier is solid state device that prevents current flow in both directions. And it prevents the temperature rise of the high voltage transformer by blowing the fuse F2 F8A when the high voltage rectifier is shorted.



The rated peak reverse voltage of D1 of the asymmetric rectifier is 6 KV. The rated peak reverse voltage of D2 of the asymmetric rectifier is 1.7 KV. D1 and D2 of the asymmetric rectifier or high voltage rectifier are shorted when the each peak reverse voltage goes beyond the each rated peak reverse voltage. (The process of the blowing the fuse F2 F8A.)

1. The high voltage rectifier is shorted by some fault when microwave cooking or dual cooking.
2. The peak reverse voltage of D2 of the rectifier goes beyond the rated peak reverse voltage 1.7 KV in the voltage doubler circuit.
3. D2 of the rectifier is shorted.
4. The large electric currents flow through the high voltage winding of the high voltage transformer.
5. The large electric currents beyond 8A flow through the primary winding of the high voltage transformer.
6. The fuse F2 F8A blows by the large electric currents.
7. The power supplying to the high voltage transformer is cut off.

NOISE FILTER

The noise filter assembly prevents radio frequency interference that might flow back in the power circuit.

TURNTABLE MOTOR TTM

The turntable motor rotates the turntable.

FAN MOTOR FM

The fan motor drives a blade which draws external cool air. This cool air is directed through the air vanes surrounding the magnetron and cools the magnetron. This air is channelled through the oven cavity to remove steam and vapours given off from heating food. It is then exhausted through the exhausting air vents of the oven cavity.

CONVECTION MOTOR CM

The convection motor drives the convection fan and provides the heated air.

GRILL HEATING ELEMENT GH

The grill heating elements are provided to brown the food and are located on the top of the oven cavity.

CONVECTION HEATING ELEMENT CH

The convection heating element situated at the rear of the oven cavity. It is intended to heat air driven by the convection fan. The heated air is kept in the oven and force-circulated and reheated by the convection heating element.

CONVECTION COOKING SYSTEM

This oven is designed with a hot air heating system where food is heated by forced circulation of the hot air produced by the grill heaters. The air heated by the grill heating elements is circulated through the convection passage provided on the outer casing of the oven cavity by means of the convection fan which is driven by the convection motor. It is then enters the inside of the oven through the vent holes provided on the back side of the oven. Next, the hot air heats the food on the turntable and leaves the oven cavity through the vent in the oven cavity rear wall. In this way, the hot air circulates inside the oven cavity to raise its temperature and, at the same time, comes into contact with the food being cooked. When the temperature inside the oven cavity reaches the selected temperature, the heating elements are de-energized. When the temperature inside the oven cavity drops below the selected temperature, the heating elements are energized again. In this way, the inside of the oven cavity is maintained at approximately the selected temperature. When the convection time reaches “0”, the heating elements are de-energized and the convection fan stops operating and the oven shuts off. At that time if the cavity air temperature has raisen above 120˚C, the fan motor remains rotating. Automatically the fan motor will be shut down at low temperature (less than 105˚C).

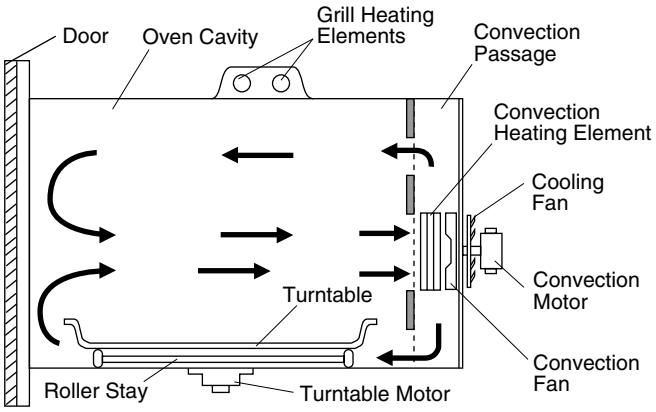


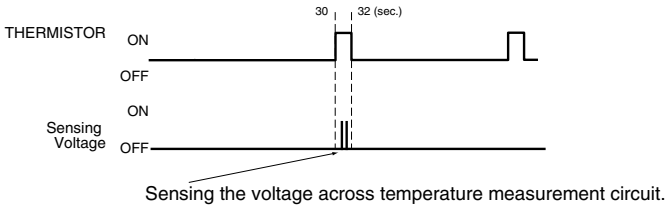
Figure D-2. Convection Cooking System

FIRE SENSING FEATURE

The oven will stop its operation when there is a fire in the oven cavity in microwave cooking condition.
LSI measures the voltage across the temperature measurement circuit intermittently within 32-seconds time base since the oven is started in microwave cooking condition. The oven will stop its operation when the difference of the voltage is more than 0.39 volts in microwave cooking condition.

1. Within a 32-seconds base, the thermistor is energized for 2 seconds. At that time, the voltage across the temperature measurement circuit is measured.
2. The oven carries out the procedure above again. If the second voltage is 0.39V higher than first voltage, LSI judges it is a fire in the oven cavity and stop the oven.
3. When LSI judges it is a fire in the oven cavity, LSI will switch off the relays to high voltage transformer and fan motor and LSI stops counting down.

OPERATION SEQUENCE



Sensing the voltage across temperature measurement circuit.

OPEN JUDGE BY THERMISTOR

1. If the temperature of the thermistor does not rise to more than 40˚C after 4 minutes and 15 seconds from when the oven is started in convection, grill or dual cooking mode, the oven is turned off.
2. When the thermistor or the wire harness to the thermistor is opened, the oven is turned off after 4 minutes and 15 seconds because this condition is same as above.

DAMPER OPEN-CLOSE MECHANISM

Damper position is set automatically by damper motor DM, damper switch and motor cam.
These components are operated by a signal that judges if microwave cooking or convection cooking operation is selected by the CPU unit.

Microwave Cooking:
Damper is in the open position, because a portion of cooling air is channelled through the cavity to remove steam and vapours given off from the heating foods.
It is then exhausted at the top of the oven cavity into a condensation compartment.

Convection Cooking:
Damper is in the closed position, so that no hot air will be allowed to leak out the oven cavity.

Damper Operation
1. When power supply cord is plugged in or when the control unit resumes after energy save mode finishes:
1-1. When power supply cord is plugged in, a signal is sensed in the control unit, and operates shut-off relay (RY8).
1-2. Contacts of shut-off relay (RY8) close, the damper motor DM is energized, opening the damper door.
1-3. When the damper is moved to the open position by the damper cam, damper switch SW4 is closed (ON position).
1-4. The signal of damper switch SW4 is re-sensed in the control unit and shut-off relay (RY8) is turned off.
1-5. The rated voltage to the damper motor DM is stopped and the motor turns off.
2. When oven is microwave cooking:
Damper is in the open position
3. When oven is convection cooking:
3-1 Damper motor DM is energized right after the oven is started.
3-2. When damper is in the closed position (damper switch SW4 is OFF), its signal is sensed by the control unit, and shut-off relay (RY8) is de-energized.
3-3. The damper is held in the closed position during the convection cooking operation.
3-4. At the end of the convection cooking, when the fan motor FM stops, shut-off relay (RY8) is energized, and the damper is returned to the open position.

NOTE: If the damper door is not in the proper position, closed during convection, grill or dual, or open during microwave, the control unit will stop oven operation after 1 minute.

4. Operation of damper is shown below.

Cooking Mode	Operation of Damper
Microwave cooking	Open
Convection cooking	Closed
Grill; during backed up with convection heating element	Closed
Grill; after convection heating element backed up has stopped	Open
Dual (Microwave and Convection)	Closed
Dual (Microwave and Grill)	Open
Fire sensing condition	Closed

TROUBLESHOOTING GUIDE

When troubleshooting the microwave oven, it is helpful to follow the Sequence of Operation in performing the checks. Many of the possible causes of trouble will require that a specific test be performed. These tests are given a procedure letter which will be found in the “Test Procedure” section.

IMPORTANT: If the oven becomes inoperative because of a blown fuse F2 (F8A) in the monitored latch switch SW1 - monitor switch SW3 circuit, check the monitored latch switch SW1 and monitor switch SW3 before replacing the fuse F2 (F8A).

TROUBLESHOOTING GUIDE

TEST PROCEDURE	POSSIBLE CAUSE AND DEFECTIVE PARTS \ PROBLEM	Fuse F2 (F8A) blows when the door is opened.	Home fuse blows when power cord is plugged into wall outlet.	Fuse F1 20A blows when power cord is plugged into wall outlet.	Nothing appears in display when power cord is plugged into wall outlet and the door is opened and closed.	Display does not operate properly when STOP button is pressed.	Oven lamp does not light when door is opened. (Display operates.)	Oven does not start when the START button is pressed. (Display operates.)	Oven lamp does not light and turntable motor does not operate.	Fan motor does not operate. (Oven lamp lights.)	Convection fan motor does not operate. (Fan motor operates.)	Turntable motor does not operate. (Oven lamp lights.)	Oven or any electrical parts (except fan motor) does not stop when cooking time is 0 or STOP button is pressed.	Oven stops after 4 minutes and 15 seconds since START button is pressed. (Except Microwave mode and Dual cook mode)	Display operates properly but all electrical parts do not operate.	Oven goes into cook cycle but shuts down before end of cooking cycle.	After cooking, the temperature of oven cavity is higher than 120˚C but fan motor does not operate.	The oven stops 1 minute after starting.	Oven seems to be operating but little or no heat is produced in oven load. (Microwave power control is set at 100%)	Oven does not seem to be operating properly during variable cooking condition except 100% cooking condition.	Oven goes into cook cycle but shuts down before end of cooking cycle.	Convection cooking mode does not heat.	Oven seems to be operating but the temperature in the oven cavity is lower or higher than preset one.	Grill heating element does not operate.	Oven goes into cook cycle but shuts down before end of cooking cycle.	Oven seems to be operating but little or no heat is produced in oven load. (Microwave power does not seem to be generated properly)	Oven seems to be operating but the temperature in the oven cavity is lower or higher than preset one.	Convection heating elements do not heat.	Grill heating element does not heat.
	CONDITION	OFF CONDITION						COOKING CONDITION (COMMON MODE)											MICROWAVE COOKING CONDITION			CONVECTION COOKING CONDITION		GRILL COOKING CONDITION	DUAL COOKING CONDITION (COMMON MODE)		DUAL COOKING CONDITION (MICRO./CONV.)		DUAL COOKING CONDITION (MICRO./GRILL)
	BLOCKED COOLING FAN									○						○					○				○				
	BLOCKED CONVECTION FAN										○					○							○				○		
	NO POWER AT WALL OUTLET				○																								
	HOME FUSE OR BREAKER		○																						○				
	MIS-ADJUSTMENT OF SWITCHES					○		○				○							○			○		○		○		○	○
	BLOCKED VENTILATION OPENINGS															○					○				○				
	OPENED WIRE HARNESS				○	○	○	○	○	○	○	○		○	○			○	○		○	○		○	○	○		○	○
	SHORTED WIRE HARNESS			○			○											○	○			○			○	○			
	OVEN LAMP OR SOCKET						○		○																				
	POWER SUPPLY CORD		○		○																								
P	FOIL PATTERN ON P.W.B.				○																								
O	RELAY RY8																	○			○				○				
O	RELAY RY7										○		○		○														
O	RELAY RY6									○			○		○														
O	RELAY RY5				○																								
O	RELAY RY4												○		○							○	○				○	○	
O	RELAY RY3												○		○									○					○
O	RELAY RY2												○		○				○	○						○			
O	RELAY RY1	○					○		○				○		○														
N	KEY UNIT					○		○					○																
M	TOUCH CONTROL PANEL				○	○	○	○					○	○			○		○	○		○	○		○	○	○		
	TC TRANSFORMER				○																								
L	CONVECTION HEATING ELEMENT																					○	○				○	○	
L	GRILL HEATING ELEMENT																							○					○
K	FUSE F2 F8A	○																	○							○			
J	FUSE F1 20A			○	○																								
I	NOISE FILTER			○	○																								
H	DAMPER MOTOR DM																	○			○				○				
H	CONVECTION FAN MOTOR										○					○							○				○		
H	FAN MOTOR FM									○						○					○				○				
H	TURNTABLE MOTOR TM								○			○																	
G	THERMAL CUT-OUT 170˚C TC3								○						○														
G	THERMAL CUT-OUT 170˚C TC2				○											○									○				
G	THERMAL CUT-OUT 125˚C TC1				○											○					○				○				
F	THERMISTOR													○		○	○				○	○	○		○		○		
E	DAMPER SWITCH SW4																	○											
E	MONITOR SWITCH SW3																		○			○		○		○		○	○
E	STOP SWITCH SW2					○	○	○																					
E	MONITORED LATCH SWITCH SW1	○			○							○														○			
D	HIGH VOLTAGE CAPACITOR																		○							○			
	H.V. HARNESS																		○							○			
C	H.V. RECTIFIER ASSEMBLY																		○							○			
B	HIGH VOLTAGE TRANSFORMER																		○							○			
A	MAGNETRON																		○							○			

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST

A **MAGNETRON TEST**

NEVER TOUCH ANY PART IN THE CIRCUIT WITH YOUR HAND OR AN INSULATED TOOL WHILE THE OVEN IS IN OPERATION.

CARRY OUT 3D CHECKS.

Isolate the magnetron from high voltage circuit by removing all leads connected to filament terminal.

To test for an open circuit filament use an ohmmeter to make a continuity test between the magnetron filament terminals, the meter should show a reading of less than 1 ohm.

To test for short filament to anode condition, connect ohmmeter between one of the filament terminals and the case of the magnetron (ground). This test should be indicated an infinite resistance. If a low or zero resistance reading is obtained then the magnetron should be replaced.

MICROWAVE OUTPUT POWER (IEC-705-1988)

The following test procedure should be carried out with the microwave oven in a fully assembled condition (outer case fitted). Microwave output power from the magnetron can be measured by way of IEC 60705, i.e. it is measured by how much power the water load can absorb. To measure the microwave output power in the microwave oven, the relation of calorie and watt is used. When P(W) heating works for t(second), approximately P x t/4.187 calorie is generated. On the other hand, if the temperature of the water with V(ml) rises ΔT (°C) during this microwave heating period, the calorie of the water is V x ΔT.

The formula is as follows;

$P \times t / 4.187 = V \times \Delta T + 0.55 \times mc\ (T2-T0)$ $\quad P\ (W) = 4.187 \times V \times \Delta T / t + 0.55 \times mc\ (T2-T0)/t$

Our condition for water load is as follows:

Room temperature (T0) ... around 20°C	Power supply Voltage ..... Rated voltage
Water load ..... 1000 g	Initial temperature (T1) ..... 10±1°C
Heating time ..... 47 sec.	Mass of container (mc) ..... 330 g
T2 ..... Final Temperature	$P = 90 \times \Delta T + 0.55 \times mc\ (T2-T0)/47$

Measuring condition:

1. Container
   The water container must be a cylindrical borosilicate glass vessel having a maximum material thickness of 3 mm and an outside diameter of approximately 190 mm.
2. Temperature of the oven and vessel
   The oven and the empty vessel are at ambient temperature prior to the start the test.
3. Temperature of the water
   The initial temperature of the water is (10±2)°C.
4. Select the initial and final water temperature so that the maximum difference between the final water temperature and the ambient temperature is 5K.
5. Select stirring devices and measuring instruments in order to minimize addition or removal of heat.
6. The graduation of the thermometer must be scaled by 0.1°C at minimum and be an accurate thermometer.
7. The water load must be (1000±5) g.
8. "t" is measured while the microwave generator is operating at full power. Magnetron filament heat-up time is not included.

NOTE: The operation time of the microwave oven is "t + 3" sec. (3 sec. is magnetron filament heat-up time.)

Measuring method:

1. Measure the initial temperature of the water before the water is added to the vessel.
   (Example: The initial temperature T1 = 11°C)
2. Add the 1 litre water to the vessel.
3. Place the load on the centre of the shelf.
4. Operate the microwave oven at HIGH for the temperature of the water rises by a value Δ T of (10 ± 2) K.
5. Stir the water to equalize temperature throughout the vessel.
6. Measure the final water temperature. (Example: The final temperature T2 = 21°C)
7. Calculate the microwave power output P in watts from above formula.

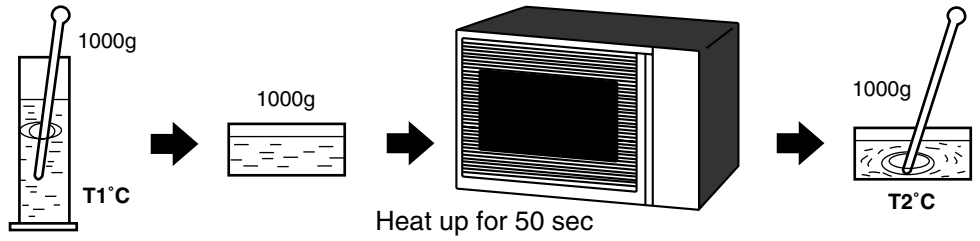
TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST

Room temperature ..... To = 21˚C Initial temperature ..... T1 = 11°C
Temperature after (47 + 3) = 50 sec. ..... T2 = 21°C
Temperature difference Cold-Warm ..... ΔT1 = 10°C
Measured output power
The equation is "P = 90 x ΔT" ..... P = 90 x 10°C = 900 Watts

JUDGMENT: The measured output power should be at least ± 15 % of the rated output power.

CAUTION: 1°C CORRESPONDS TO 90 WATTS. REPEAT MEASUREMENT IF THE POWER IS INSUFFICIENT.



B HIGH VOLTAGE TRANSFORMER TEST

WARNING: High voltage and large currents are present at the secondary winding and filament winding of the high voltage transformer. It is very dangerous to work near this part when the oven is on. NEVER make any voltage measurements of the high-voltage circuits, including the magnetron filament.

CARRY OUT 3D CHECKS.
Disconnect the leads to the primary winding of the high voltage transformer. Disconnect the filament and secondary winding connections from the rest of the HV circuitry. Using an ohmmeter, set on a low range, it is possible to check the continuity of all three winding. The following readings should be obtained:

a. Primary winding ..... approximately 2 Ω
b. Secondary winding ..... approximately 127 Ω
c. Filament winding ..... less than 1 Ω

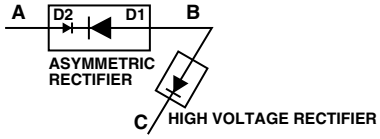
If the readings obtained are not stated as above, then the high voltage transformer is probably faulty and should be replaced.

CARRY OUT 4R CHECKS.

C HIGH VOLTAGE RECTIFIER TEST

CARRY OUT 3D CHECKS.
Isolate the high voltage rectifier assembly from the HV circuit. The high voltage rectifier can be tested using an ohmmeter set to its highest range. Connect the ohmmeter across the terminal B+C of the high voltage rectifier and note the reading obtained. Reverse the meter leads and note this second reading. The normal resistance is infinite in one direction and more than 100 kΩ in the other direction.

CARRY OUT 4R CHECKS.



ASYMMETRIC RECTIFIER TEST

CARRY OUT 3D CHECKS.

Isolate the high voltage rectifier assembly from the HV circuit. The asymmetric rectifier can be tested using an ohmmeter set to its highest range across the terminals A+B of the asymmetric rectifier and note the reading obtained. Reverse the meter leads and note this second reading. If an open circuit is indicated in both directions then the asymmetric rectifier is good. If the asymmetric rectifier is shorted in either direction, then the asymmetric rectifier is probably faulty and must be replaced with high voltage rectifier. When the asymmetric rectifier is defective, check whether magnetron, high voltage rectifier, high voltage wire or filament winding of the high voltage transformer is shorted.

CARRY OUT 4R CHECKS.

NOTE: FOR MEASUREMENT OF THE RESISTANCE OF THE RECTIFIER, THE BATTERIES OF

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST

THE MEASURING INSTRUMENT MUST HAVE A VOLTAGE AT LEAST 6 VOLTS, BECAUSE OTHERWISE AN INFINITE RESISTANCE MIGHT BE SHOWN IN BOTH DIRECTIONS.

D **HIGH VOLTAGE CAPACITOR TEST**

CARRY OUT 3D CHECKS.

A. Isolate the high voltage capacitor from the circuit.
B. Continuity check must be carried out with measuring instrument which is set to the highest resistance range.
C. A normal capacitor shows continuity for a short time (kick) and then a resistance of about 10MΩ after it has been charged.
D. A short-circuited capacitor shows continuity all the time.
E. An open capacitor constantly shows a resistance about 10 MΩ because of its internal 10MΩ resistance.
F. When the internal wire is opened in the high voltage capacitor shows an infinite resistance.
G. The resistance across all the terminals and the chassis must be infinite when the capacitor is normal.

If incorrect reading are obtained, the high voltage capacitor must be replaced.

CARRY OUT 4R CHECKS.

E **SWITCH TEST**

CARRY OUT 3D CHECKS.
Isolate the switch to be tested and using an ohmmeter check between the terminals as described in the following table.

Table: Terminal Connection of Switch

Plunger Operation	COM to NO	COM to NC
Released	Open circuit	Short circuit
Depressed	Short circuit	Open circuit

COM; Common terminal,
NO; Normally open terminal
NC; Normally close terminal

If incorrect readings are obtained, make the necessary switch adjustment or replace the switch.

CARRY OUT 4R CHECKS.

F **THERMISTOR TEST**

CARRY OUT 3D CHECKS.
Disconnect theconnector B from CPU unit. Measure the resistance of the thermistor with an ohmmeter. Connect the ohmmeter leads to Pin No's C1 and C3 of the thermistor harness.

Room Temperature	Resistance
20˚C - 30˚C	Approximately 359.9 kΩ - 152 kΩ

If the meter does not indiicate above resistance, replace the thermistor.

CARRY OUT 4R CHECKS.

G **THERMAL CUT-OUT TEST**

CARRY OUT 3D CHECKS.

Disconnect the leads from the terminals of the thermal cut-out. Then using an ohmmeter, make a continuity test across the two terminals as described in the below.

Table: Thermal Cut-out Test

Parts Name	Temperature of "ON" condition (closed circuit). (˚C)	Temperature of "OFF" condition (open circuit). (˚C)	Indication of ohmmeter (When room temperature is approx. 20˚C.)
Thermal cut-out TC1 125˚C	This is not resetable	Above 125˚C	Closed circuit
Thermal cut-out TC2 170˚C	Below 155˚C.	Above 170˚C	Closed circuit
Thermal cut-out TC3 170˚C	Below 155˚C.	Above 170˚C	Closed circuit

If incorrect readings are obtained, replace the thermal cut-out.

PROCEDURE LETTER	COMPONENT TEST

An open circuit thermal cut-out (MG) TC1 indicates that the magnetron has overheated, this may be due to resistricted ventilation, cooling fan failure.

An open circuit thermal cut-out (GRILL) TC2 indicates that the oven cavity has overheated, this may be due to no load operation..

An open circuit thermal cut-out (CONV.) TC3 indicates that the convection fan winding has overheated, this may be due to resistricted ventilation or locked cooling fan or locked convection fan motor.

CARRY OUT 4R CHECKS.

H **MOTOR WINDING TEST**

CARRY OUT 3D CHECKS.

Disconnect the leads from the motor. Using an ohmmeter, check the resistance between the two terminals as described in the table below.

Table: Resistance of Motor

Motors	Resistance
Fan motor	Approximately 293 Ω
Turntable motor	Approximately 15 kΩ
Convection fan motor	Approximately 288 Ω
Damper motor	Approximately 11 kΩ

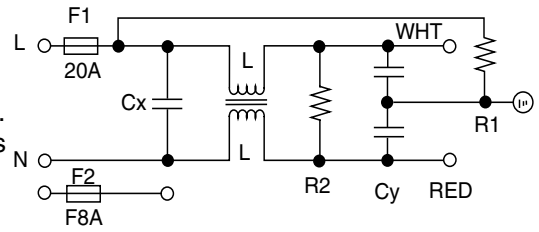
If incorrect readings are obtained, replace the motor.

CARRY OUT 4R CHECKS.

I **NOISE FILTER TEST**

CARRY OUT 3D CHECKS.

Disconnect the leads from the terminals of noise filter. Using an ohmmeter, check between the terminals as described in the following table.



L (min)	Cx ± 20%	Cy ± 20%	R1	R2
1.0mH	0.22μF	4700pF	10MΩ	680kΩ

MEASURING POINTS	INDICATION OF OHMMETER
Between N and L	Approx. 680 kΩ
Between terminal N and WHITE	Short circuit
Between terminal L and RED	Short circuit

If incorrect readings are absorbed, replace the noise filter unit.

CARRY OUT 4R CHECKS.

J **BLOWN FUSE F1 20A**

CARRY OUT 3D CHECKS.
If the fuse F1 20A is blown, there is a shorts or grounds in electrical parts or wire harness. Check them and replace the defective parts or repair the wire harness.

CARRY OUT 4R CHECKS.

CAUTION: Only replace fuse with the correct value replacement.

K **BLOWN FUSE F2 F8A**

CARRY OUT 3D CHECKS.

1. If the fuse F2 F8A is blown when the door is opened, check the monitored latch switch SW1 and monitor switch SW3.
2. If the fuse F2 F8A is blown by incorrect door switching replace the defective switch(es) and the fuse F2 F8A.

PROCEDURE LETTER	COMPONENT TEST

3. If the fuse F2 F8A is blown, there could be shorts in the asymmetric rectifier or there is a ground in wire harness. A short in the asymmetric rectifier may be occurred due to short or ground in H.V. rectifier, magnetron, high voltage transformer or H.V. wire. Check them and replace the defective parts or repair the wire harness.

CARRY OUT 4R CHECKS.

CAUTION: Only replace fuse F2 F8A with the correct value replacement.

L GRILL HEATING ELEMENTS (TOP) AND CONVECTION HEATING ELEMENT TEST

CARRY OUT 3D CHECKS.

Before carrying out the following tests make sure the heating element is cool completely.

1. Resistance of heating element.
   Disconnect the wire leads to the heating element to be tested. Using ohmmeter with low resistance range. Check the resistance across the terminals of the heating element as described in the following table.

Table: Resistance of heating element

Parts name	Resistance
Grill heating elements GH (top)	Approximately 44.4 Ω (22.2 Ω x 2)
Convection heating element CH	Approximately 42.5 Ω

2. Insulation resistance.
   Disconnect the wire leads to the heating element to be tested. Check the insulation resistance between the element terminal and cavity using a 500V - 100MΩ insulation tester. The insulation resistance should be more than 10 MΩ in the cold start.

If the results of above test 1 and/or 2 are out of above specifications, the heating element is probably faulty and should be replaced.

CARRY OUT 4R CHECKS.

M CONTROL PANEL ASSEMBLY TEST

The control panel consists of circuits including semiconductors such as LSI, ICs, etc. Therefore, unlike conventional microwave ovens, proper maintenance can not be performed with only a voltmeter and ohmmeter.
In this service manual, the control panel assembly is divided into two units, Control Unit and Jog and Switch Unit, and also the control unit is divided into two units, CPU unit and Power unit, and troubleshooting by replacement is described according to the symptoms indicated.

1. Jog and Switch Unit Note : Check Jog and Switch unit wire harness connection before replacement.
   The following symptoms indicate a defective Jog and Switch unit. Replace the Jog and Switch unit.
   1-1. Tact switch
   a) When touching the buttons, a certain button produces no signal at all.
   b) When touching the buttons, sometimes a button produces no signal.
   1-2. Potentiometer
   a) When rotating the potentiometer, the cooking mode can not be selected.
   1-3. Encoder
   a) When rotating the encoder, the cooking time or the weight of food can not be entered.
2. Control Panel
   The following symptoms indicate a defective control unit. Before replacing the control unit. perform the Jog and Switch unit test (Procedure N) to determine if control unit is faulty.

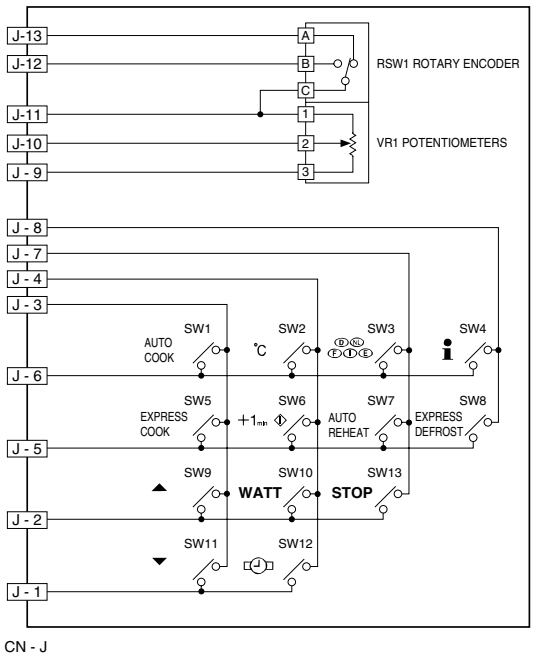
2-1 In connection with buttons
   a) When touching the buttons, a certain group of buttons do not produce a signal.
   b) When touching the buttons, no buttons produce a signal.

2-2 In connection with indicators
   a) At a certain digit, all or some segments do not light up.
   b) At a certain digit, brightness is low.
   c) Only one indicator does not light up.
   d) The corresponding segments of all digits do not light up; or they continue to light up.
   e) Wrong figure appears.
   f) A certain group of indicators do not light up.
   g) The figure of all digits flicker.

2-3 Other possible troubles caused by defective control unit.
- a) Buzzer does not sound or continues to sound.
- b) Clock does not operate properly.
- c) Cooking is not possible.
- d) Proper temperature measurement is not obtained.

N JOG AND SWITCH UNIT TEST

If the display fails to clear when the STOP button (tact switch SW13) is depressed, first verify the wire harness is marking good contact, verify that the door sensing switch (stop switch) operates properly; that is the contacts are closed when the door is closed and open when the door is open. If the door sensing switch (stop switch) is good, disconnect the wire harness that connects the Jog and Switch unit to the control unit and make sure the door sensing switch is closed (either close the door or short the door sensing switch connecter). Use the Jog and Switch unit matrix indicated on the control panel schematic and place a jumper wire between the pins that correspond to the STOP button (tact switch SW13) marking momentary contact. If the control unit responds by clearing with a beep the Jog and Switch unit is faulty and must be replaced. If the control unit does not respond, it is a faulty and must be replaced. If a specific button does not respond, the above method may be used (after clearing the control unit) to determine if the control unit or Jog and Switch unit is at fault.



CARRY OUT 4R CHECKS.

O RELAY TEST

CARRY OUT 3D CHECKS.

Remove the outer case and check voltage between Pin Nos. 1 and 3 of the 4 pin connector (E) on the control unit with an A.C. voltmeter.
The meter should indicate 230 volts, if not check oven circuit.

Relay Test
Check voltage at the relay coil with a D.C. voltmeter during the microwave cooking operation, grill operation, convection operation or dual operation.

DC. voltage indicated ..... Defective relay.
DC. voltage not indicated .... Check diode which is connected to the relay coil. If diode is good, control unit is defective.

RELAY SYMBOL	OPERATIONAL VOLTAGE	CONNECTED COMPONENTS
RY1	Approx. 18.0V D.C.	Oven lamp / Turntable motor
RY2	Approx. 18.0V D.C.	High voltage transformer
RY3	Approx. 24.0V D.C.	Grill (Top) heating element
RY4	Approx. 24.0V D.C.	Convection heating element
RY5	Approx. 24.0V D.C.	Touch control transformer
RY6	Approx. 24.0V D.C.	Fan motor
RY7	Approx. 24.0V D.C.	Convection motor
RY8	Approx. 24.0V D.C.	Damper motor

CARRY OUT 4R CHECKS.

PROCEDURE LETTER	COMPONENT TEST

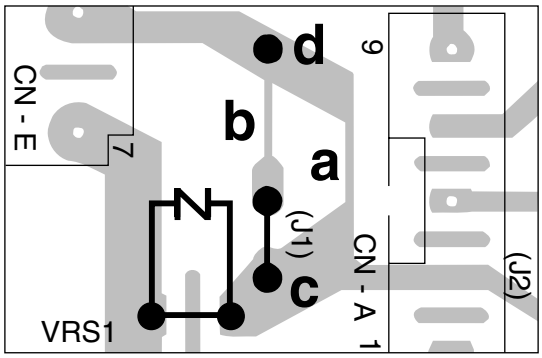
P **PROCEDURES TO BE TAKEN WHEN THE FOIL PATTERN ON THE PRINTED WIRING BOARD (PWB) IS OPEN**

To protect the electronic circuits, this model is provided with a fine foil pattern added to the input circuit on the PWB, this foil pattern acts as a fuse. If the foil pattern is open, follow the troubleshooting guide given below for repair.
Problem: POWER ON, indicator does not light up.

CARRY OUT 3D CHECKS.

STEPS	OCCURRENCE	CAUSE OR CORRECTION
1	The rated AC voltage is not present between Pin Nos. 1 and 3 of the 4-pin connector (E).	Check supply voltage and oven power cord.
2	The rated AC voltage is present at primary side of low voltage transformer.	Low voltage transformer or secondary circuit defective. Check and repair.
3	Only pattern at "a" is broken.	*Insert jumper wire J1 and solder. (CARRY OUT 3D CHECKS BEFORE REPAIR)
4	Pattern at "a" and "b" are broken.	*Insert the coil RCILF2003YAZZ between "c" and "d". (CARRY OUT 3D CHECKS BEFORE REPAIR)

NOTE: *At the time of these repairs, make a visual inspection of the varistor for burning damage and examine the transformer with tester for the presence of layer short circuit (check primary coil resistance).
If any abnormal condition is detected, replace the defective parts.



CARRY OUT 4R CHECKS.

CONTROL PANEL ASSEMBLY

OUTLINE OF CONTROL PANEL

The control section consists of the following units as shown in the control panel circuit.

(1) Jog and Switch Unit
(2) Control Unit (The Control unit consists of Power unit and CPU unit.)

The principal functions of these units and signals communicated among them are explained below.

Jog and Switch Unit

1) Tact switch circuit
The jog and switch unit is composed of a matrix, signals generated in the LSI are sent to the jog and switch unit from P14, P15, P16 and P17.
When a tact switch pad is touched, a signal is completed through the jog and switch unit and passed back to the LSI through P70, P71, P72 and P73 to perform the function that was requested.
2) Encoder
The encoder converts the signal generated by LSI into the pulse signal, and the pulse signal is returned to the LSI.
3) Potentiometer circuit
The circuit makes setting of the cooking mode by variable resistance.

Control Unit

Control unit consists of LSI, power source circuit, synchronizing signal circuit, ACL circuit, buzzer circuit, relay circuit, temperature measurement circuit, indicator circuit and back light circuit.

1) LSI
This LSI controls the temperature measurement signal, tact switch strobe signal, relay driving signal for oven function and indicator signal.

2) Power Source Circuit
This circuit generates voltage necessary in the control unit.

Symbol	Voltage	Application
VC	-5.2V	LSI(IC1)

3) Synchronizing Signal Circuit
The power source synchronizing signal is available in order to compose a basic standard time in the clock circuit. It accompanies a very small error because it works on commercial frequency.

4) ACL
A circuit to generate a signal which resets the LSI to the initial state when power is supplied.

5) Buzzer Circuit
The buzzer is responsive to signals from the LSI to emit audible sounds (tact switch touch sound and completion sound).

6) Door Sensing Switch (Stop Switch)
A switch to "tell" the LSI if the door is open or closed.

7) Relay Circuit
To drive the magnetron, grill heating element, convection heating element, convection motor, fan motor, turntable motor, damper motor, touch control transformer and light the oven lamp.

8) Back Light Circuit
A circuit to drive the back light (Light emitting diodes LD10 - LD19).

9) Indicator Circuit
This circuit consists 40-segments and 16-common electrodes using a Liquid Crystal Display.
The Liquid Crystal Display (LCD) is drived by LCD driver IC3.

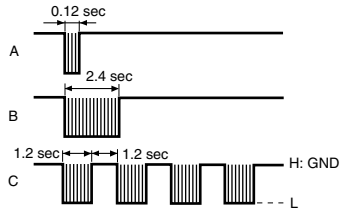
10) Temperature Measurement Circuit : (OVEN THERMISTOR)
The temperature in the oven cavity is sensed by the thermistor. The variation of resistance according to sensed temperature is detected by the temperature measurement circuit and the result applied to LSI. The LSI uses this information to control the relay and display units.

11) Damper Switch
A switch to tell the LSI if the damper is open or close.

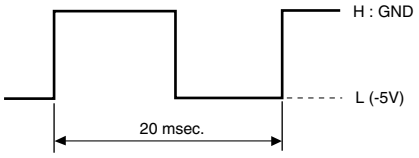
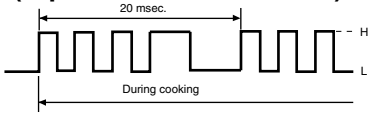
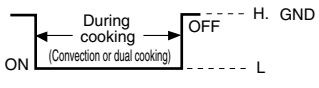
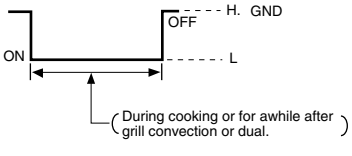
DESCRIPTION OF LSI

LSI(IXA036DR)

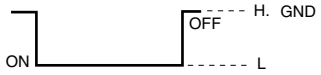
The I/O signal of the LSI(IXA036DR) are detailed in the following table.

<table>
<tr><th>Pin No.</th><th>Signal</th><th>I/O</th><th>Description</th></tr>
<tr><td>1</td><td>AN0</td><td>IN</td><td>Terminal not used.</td></tr>
<tr><td>2</td><td>P77</td><td>OUT</td><td><u>Timing signal output terminal for temperature measurement(OVEN THERMISTOR).</u>
"H" level (GND) : Thermistor OPEN timing.
"L" level (-5V) : Temperature measuring timing. (Convection cooking)</td></tr>
<tr><td>3</td><td>P76</td><td>OUT</td><td><u>Timing signal output terminal for temperature measurement(OVEN THERMISTOR).</u>
"H" level (GND) : Thermistor OPEN timing.
"L" level (-5V) : Temperature measuring timing. (Convection cooking)</td></tr>
<tr><td>4-5</td><td>P75-P74</td><td>OUT</td><td>Terminal not used.</td></tr>
<tr><td>6</td><td>P73</td><td>IN</td><td><u>Signal coming from touch tact switch.</u>
When any one of J-3 line tact switches on tact switch matrix is touched, a corresponding signal from P14, P15, P16 and P17 will be input into P73. When no tact switch is touched, the signal is held at "L" level.</td></tr>
<tr><td>7</td><td>P72</td><td>IN</td><td><u>Signal similar to P73.</u>
When any one of J-4 line tact switches on tact switch matrix is touched, a corresponding signal will be input into P72.</td></tr>
<tr><td>8</td><td>P71</td><td>IN</td><td><u>Signal similar to P73.</u>
When any one of J-7 line tact switches on tact switch matrix is touched, a corresponding signal will be input into P71.</td></tr>
<tr><td>9</td><td>P70</td><td>IN</td><td><u>Signal similar to P73.</u>
When any one of J-8 line tact switches on tact switch matrix is touched, a corresponding signal will be input into P70.</td></tr>
<tr><td>10-11</td><td>P57-P56</td><td>OUT</td><td>Terminal not used.</td></tr>
<tr><td>12</td><td>P55</td><td>OUT</td><td><u>Signal to sound buzzer.</u>
A: Tact switch touch sound.
B: Completion sound.
C: When the temperature of the oven cavity reaches the preset temperature in the preheating mode, or when the preheating hold time (30 minutes) is elapsed.
 
</td></tr>
<tr><td>13-17</td><td>P54-P50</td><td>OUT</td><td>Terminal not used.</td></tr>
<tr><td>18</td><td>P47</td><td>IN</td><td><u>Signal coming from encoder.</u>
When the encoder is turned, the contacts of encoder make pulse signals. And pulse signal is input into P47.</td></tr>
<tr><td>19</td><td>P46</td><td>IN</td><td><u>Input signal which communicates the damper open/close information to LSI.</u>
Damper opened; "H" level signal (0V:GND).
Damper closed; "L" level signal (-5V:VC).</td></tr>
<tr><td>20</td><td>P45</td><td>OUT</td><td>Terminal not used.</td></tr>
<tr><td>21</td><td>P44</td><td>OUT</td><td><u>Magnetron high-voltage circuit driving signal.</u>
To turn on and off the cook relay (RY2). In 100% operation, the signals hold "L" level during microwave cooking and "H" level while not cooking. In other cooking modes (70%, 50%, 30%, 10%) the signal turns to "H" level and "L" level in repetition according to the power level.
ON/OFF time ratio in Micro cooking (a. 32second time base)
<table>
<tr><th>MICRO COOK</th><th>ON</th><th>OFF</th></tr>
<tr><td>100%</td><td>32 sec.</td><td>0 sec.</td></tr>
<tr><td>70%</td><td>24 sec.</td><td>8 sec.</td></tr>
<tr><td>50%</td><td>18 sec.</td><td>14 sec.</td></tr>
<tr><td>30%</td><td>12 sec.</td><td>20 sec.</td></tr>
<tr><td>10%</td><td>6 sec.</td><td>26 sec.</td></tr>
</table>
ON/OFF time ratio in Micro cooking (a. 48second time base)
<table>
<tr><th>MICRO COOK</th><th>ON</th><th>OFF</th></tr>
<tr><td>100%</td><td>48 sec.</td><td>0 sec.</td></tr>
<tr><td>70%</td><td>36 sec.</td><td>12 sec.</td></tr>
<tr><td>50%</td><td>26 sec.</td><td>22 sec.</td></tr>
<tr><td>30%</td><td>16 sec.</td><td>32 sec.</td></tr>
<tr><td>10%</td><td>8 sec.</td><td>40 sec.</td></tr>
</table></td></tr>
<tr><td>22</td><td>INT1</td><td>IN</td><td><u>Signal coming from encoder.</u>
Signal similar to P47. Pulse signals are input into INT1.</td></tr>
</table>

DESCRIPTION OF LSI

<table>
<tr><th>Pin No.</th><th>Signal</th><th>I/O</th><th>Description</th></tr>
<tr><td>23</td><td>INT0</td><td>IN</td><td><u>Signal to synchronized LSI with commercial power source frequency(50Hz).</u>
This is basic timing for time processing of LSI.
 
</td></tr>
<tr><td>24</td><td>CNVSS</td><td>IN</td><td>Connected to VC.</td></tr>
<tr><td>25</td><td>RESET</td><td>IN</td><td><u>Auto clear terminal.</u>
Signal is input to reset the LSI to the initial state when power is applied. Temporarily set to "L" level the moment power is applied, at this time the LSI is reset. Thereafter set at "H" level.</td></tr>
<tr><td>26</td><td>P41</td><td>IN/OUT</td><td>Memory (EEPROM) data input/output.</td></tr>
<tr><td>27</td><td>P40</td><td>OUT</td><td>Memory (EEPROM) clock out.</td></tr>
<tr><td>28</td><td>XIN</td><td>IN</td><td><u>Internal clock oscillation frequency input setting.</u>
The internal clock frequency is set by inserting the ceramic filter oscillation circuit with respect to XIN terminal.</td></tr>
<tr><td>29</td><td>XOUT</td><td>OUT</td><td><u>Internal clock oscillation frequency control output.</u>
Output to control oscillation input of XOUT.</td></tr>
<tr><td>30</td><td>VSS</td><td>IN</td><td><u>Power source voltage: -5V.</u>
VC voltage of power source circuit input.</td></tr>
<tr><td>31</td><td>P27</td><td>OUT</td><td><u>Grill (TOP) heating element driving signal.</u>
To turn on and off the grill heating element relay (RY3). "L" level during grill cooking, convection cooking or dual cooking, "H" level otherwise. The heater relay turns on and off within a 48 second time base in accordance with the special program in LSI.
<table>
<tr><th>Power output</th><th>ON time</th><th>OFF time</th></tr>
<tr><td>100 %</td><td>48 sec.</td><td>0 sec.</td></tr>
<tr><td>90 %</td><td>44 sec.</td><td>4 sec.</td></tr>
<tr><td>80 %</td><td>40 sec.</td><td>8 sec.</td></tr>
<tr><td>70 %</td><td>36 sec.</td><td>12 sec.</td></tr>
<tr><td>60 %</td><td>32 sec.</td><td>16 sec.</td></tr>
<tr><td>50 %</td><td>26 sec.</td><td>22 sec.</td></tr>
<tr><td>40 %</td><td>22 sec.</td><td>26 sec.</td></tr>
<tr><td>30 %</td><td>16 sec.</td><td>32 sec.</td></tr>
<tr><td>20 %</td><td>12 sec.</td><td>36 sec.</td></tr>
<tr><td>10 %</td><td>8 sec.</td><td>40 sec.</td></tr>
</table></td></tr>
<tr><td>32</td><td>P26</td><td>OUT</td><td><u>Convection heating element driving signal.</u>
To turn on and off the relay (RY4). "L" level during grill cooking, convection cooking or dual cooking, "H" level otherwise.
The heater relay turns on and off within a 48 second time base in accordance with the special program in LSI.
<table>
<tr><th>Power output</th><th>ON time</th><th>OFF time</th></tr>
<tr><td>100 %</td><td>48 sec.</td><td>0 sec.</td></tr>
<tr><td>90 %</td><td>44 sec.</td><td>4 sec.</td></tr>
<tr><td>80 %</td><td>40 sec.</td><td>8 sec.</td></tr>
<tr><td>70 %</td><td>36 sec.</td><td>12 sec.</td></tr>
<tr><td>60 %</td><td>32 sec.</td><td>16 sec.</td></tr>
<tr><td>50 %</td><td>26 sec.</td><td>22 sec.</td></tr>
<tr><td>40 %</td><td>22 sec.</td><td>26 sec.</td></tr>
<tr><td>30 %</td><td>16 sec.</td><td>32 sec.</td></tr>
<tr><td>20 %</td><td>12 sec.</td><td>36 sec.</td></tr>
<tr><td>10 %</td><td>8 sec.</td><td>40 sec.</td></tr>
</table></td></tr>
<tr><td>33</td><td>P25</td><td>OUT</td><td><u>Oven lamp and turntable motor driving signal(Square Waveform : 50Hz).</u>
To turn on and off shut-off relay (RY1). The square waveform voltage is delivered to the relay (RY1) driving circuit.
 
</td></tr>
<tr><td>34</td><td>P24</td><td>OUT</td><td><u>Convection motor driving signal.</u>
To turn on and off shut-off relay(RY7). "L" level during convection or dual cooking "H" level otherwise. (Relay RY7 does not turn on at preheating mode.)
 
</td></tr>
<tr><td>35</td><td>P23</td><td>OUT</td><td><u>Fan motor driving signal.</u>
To turn on and off the fan motor relay RY6. "L" level during cooking, or for 5 minutes after grill cooking or for a while after convection or dual cooking. "H" level otherwise.
 
</td></tr>
<tr><td>36</td><td>P22</td><td>OUT</td><td>Terminal not used.</td></tr>
</table>

DESCRIPTION OF LSI

Pin No.	Signal	I/O	Description
37	P21	OUT	**Damper motor relay driving signal.** To turn on and off shut-off relay (RY8). 
38	P20	OUT	**Touch control transformer driving signal.** To turn on and off the shut off relay (RY5). If the oven has not been used for more than 2 minutes, the relay RY5 will be turned off. The relay RY5 will be turned on when the oven door is opened and closed.
39	P17	OUT	**Tact switch strobe signal.** Signal applied to tact switch section. A pulse signal is input to P70 - P73 terminal while one of J-6 line tact switches on matrix is touched.
40	P16	OUT	**Tact switch strobe signal.** Signal applied to tact switch section. A pulse signal is input to P70 - P73 terminal while one of J-5 line tact switches on matrix is touched.
41	P15	OUT	**Tact switch strobe signal.** Signal applied to tact switch section. A pulse signal is input to P70 - P73 terminal while one of J-2 line tact switches on matrix is touched.
42	P14	OUT	**Tact switch strobe signal.** Signal applied to tact switch section. A pulse signal is input to P70 - P73 terminal while one of J-1 line tact switches on matrix is touched.
43-46	P13-P10	OUT	Terminal not used.
47-52	P07-P02	OUT	Terminal not used.
53-54	P01-P00	OUT	Data output terminal to LCD driver IC3.
55-62	P37-P30	OUT	Data output terminal to LCD driver IC3.
63-66	P87-P84	OUT	Data output terminal to LCD driver IC3.
67-70	P83-P80	IN	Input terminal to change the specification of model.
71	VCC	IN	Connected to GND.
72	VREF	IN	Connected to GND.
73	AVSS	IN	Connected to VC.
74-76	AN7-AN5	IN	Heating constant compensation terminal.
77	AN4	IN	**Signal coming from potentiometer.** By inputting DC voltage corresponding to the cooking mode set by the potentiometer, this input is converted into cooking mode by the A/D converter built into the LSI.
78	AN3	IN	**Temperature measurement input: OVEN THERMISTOR.** By inputting DC voltage corresponding to the temperature detected by the thermistor, this input is converted into temperature by the A/D converter built into the LSI.
79	AN2	IN	**Input signal which communicates the door open/close information to LSI.** Door closed; "H" level signal. Door opened; "L" level signal.
80	AN1	IN	Terminal not used.

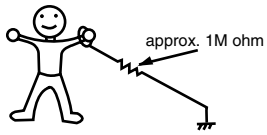
SERVICING

1. Precautions for Handling Electronic Components

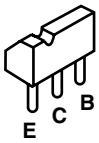
This unit uses CMOS LSI in the integral part of the circuits. When handling these parts, the following precautions should be strictly followed. CMOS LSI have extremely high impedance at its input and output terminals. For this reason, it is easily influenced by the surrounding high voltage power source, static electricity charge in clothes, etc., and sometimes it is not fully protected by the built-in protection circuit.

In order to protect CMOS LSI.

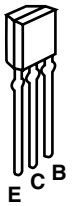
1) When storing and transporting, thoroughly wrap them in aluminium foil. Also wrap PW boards containing them in aluminium foil.
2) When soldering, ground the technician as shown in the figure and use grounded soldering iron and work table.



2. Shapes of Electronic Components



Transistor
2SB1238



Transistor
KRC243M

3. Servicing of Touch Control Panel

We describe the procedures to permit servicing of the touch control panel of the microwave oven and the precautions you must take when doing so.

To perform the servicing, power to the touch control panel is available either from the power line of the oven itself or from an external power source.

(1) Servicing the touch control panel with power supply of the oven :

CAUTION:
THE HIGH VOLTAGE TRANSFORMER OF THE MICROWAVE OVEN IS STILL LIVE DURING SERVICING AND PRESENTS A HAZARD .

Therefore, before checking the performance of the touch control panel,

1) Disconnect the power supply cord, and then remove outer case.
2) Open the door and block it open.
3) Discharge high voltage capacitor.
4) Disconnect the leads to the primary of the power transformer.
5) Ensure that these leads remain isolated from other components and oven chassis by using insulation tape.
6) After that procedure, re-connect the power supply cord.

After checking the performance of the touch control panel,

1) Disconnect the power supply cord.
2) Open the door and block it open.
3) Re-connect the leads to the primary of the power transformer.
4) Re-install the outer case (cabinet).
5) Re-connect the power supply cord after the outer case is installed.
6) Run the oven and check all functions.

A. On some models, the power supply cord between the touch control panel and the oven itself is so short that the two can't be separated.

For those models, check and repair all the controls (sensor-related ones included) of the touch control panel while keeping it connected to the oven.

B. On some models, the power supply cord between the touch control panel and the oven proper is long enough that they may be separated from each other. For those models, therefore, it is possible to check and repair the controls of the touch control panel while keeping it apart from the oven proper; in this case you must short both ends of the door sensing switch (on PWB) of the touch control panel with a jumper, which brings about an operational state that is equivalent to the oven door being closed. As for the sensor-related controls of the touch control panel, checking them is possible if the dummy resistor(s) with resistance equal to that of the controls are used.

(2) Servicing the touch control panel with power supply from an external power source:

Disconnect the touch control panel completely from the oven proper, and short both ends of the door sensing switch (on PWB) of the touch control panel, which brings about an operational state that is equivalent to the oven door being closed. Connect an external power source to the power input terminal of the touch control panel, then it is possible to check and repair the controls of the touch control panel; it is also possible to check the sensor-related controls of the touch control panel by using the dummy resistor(s).

4. Servicing Tools

Tools required to service the touch control panel assembly.

1) Soldering iron: 30W
(It is recommended to use a soldering iron with a grounding terminal.)
2) Oscilloscope: Single beam, frequency range: DC - 10MHz type or more advanced model.
3) Others: Hand tools

5. Other Precautions

1) Before turning on the power source of the control unit, remove the aluminium foil applied for preventing static electricity.
2) Connect the connector of the key unit to the control unit being sure that the lead wires are not twisted.
3) After aluminium foil is removed, be careful that abnormal voltage due to static electricity etc. is not applied to the input or output terminals.
4) Attach connectors, electrolytic capacitors, etc. to PWB, making sure that all connections are tight.
5) Be sure to use specified components where high precision is required.

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

WARNING: Avoid possible exposure to microwave energy. Please follow the instructions below before operating the oven.

1. Disconnect oven from power supply.
2. Make sure that a definite "click" can be heard when the microwave oven door is unlatched. (Hold the door in a closed position with one hand, then push the door open button with the other, this causes the latch leads to rise, it is then possible to hear a "click" as the door switches operate.)
3. Visually check the door and cavity face plate for damage (dents, cracks, signs of arcing etc.).

Carry out any remedial work that is necessary before operating the oven.
Do not operate the oven if any of the following conditions exist;

1. Door does not close firmly.
2. Door hinge, support or latch hook is damaged.
3. The door gasket or seal or damaged.
4. The door is bent or warped.
5. There are defective parts in the door interlock system.
6. There are defective parts in the microwave generating and transmission assembly.
7. There is visible damage to the oven.

Do not operate the oven:

1. Without the RF gasket (Magnetron).
2. If the wave guide or oven cavity are not intact.
3. If the door is not closed.
4. If the outer case (cabinet) is not fitted.

Please refer to 'OVEN PARTS, CABINET PARTS, CONTROL PANEL PARTS, DOOR PARTS', when carrying out any of the following removal procedures:

WARNING FOR WIRING

To prevent an electric shock, take the following manners.

1. Before wiring,
   1) Disconnect the power supply.
   2) Open the door and wedge the door open.
   3) Discharge the high voltage capacitor and wait for 60 seconds.
2. Don't let the wire leads touch to the following parts;
   1) High voltage parts:
      Magnetron, High voltage transformer, High voltage capacitor and High voltage rectifier assembly.
   2) Hot parts:
      Grill heating element, Convection heating element, Oven lamp, Magnetron, High voltage transformer and Oven cavity.
   3) Sharp edge:
      Bottom plate, Oven cavity, Weveguide flange, Chassis support and other metallic plate.
   4) Movable parts (to prevent a fault)
      Fan blade, Fan motor, Switch, Turntable motor, Convection motor, convection fan and colling fan.
3. Do not catch the wire leads in the outer case cabinet.
4. Insert the positive lock connector certainly until its pin is locked. And make sure that the wire leads should not come off even if the wire leads is pulled.
5. To prevent an error function, connect the wire leads correctly, referring to the Pictorial Diagram.

OUTER CASE REMOVAL

To remove the outer case proceed as follows.

1. Disconnect oven from power supply.
2. Open the oven door and wedge it open.
3. Remove the one (1) screw holding the air to the oven cavity rear plate.
4. Remove the air duct.
5. Remove the nine (9) screws from rear and along the side edge of case.
6. Slide the entire case back about 3 cm to free it from retaining clips on the cavity face plate.
7. Lift the entire case from the oven.
8. Discharge the H.V. capacitor before carrying out any further work.
9. Do not operate the oven with the outer case removed.

N.B.; Step 1, 2 and 8 form the basis of the 3D checks.

CAUTION: DISCHARGE HIGH VOLTAGE CAPACITOR BEFORE TOUCHING ANY OVEN COMPONENT OR WIRING.

HIGH VOLTAGE COMPONENTS REMOVAL (HIGH VOLTAGE CAPACITOR AND HIGH VOLTAGE RECTIFIER ASSEMBLY)

To remove the components, proceed as follows.

1. CARRY OUT 3D CHECKS.
2. Disconnect the filament lead of the high voltage transformer and the high voltage wire of the high voltage transformer from the high voltage capacitor.
3. Disconnect the high voltage wire B from the high voltage capacitor.
4. Remove one (1) screw holding earth side terminal of the high voltage rectifier assembly to the base plate through the capacitor holder.
5. Release the capacitor holder from the base plate.
8. Remove the high voltage capacitor from the capacitor holder.
7. Disconnect the high voltage rectifier assembly from the high voltage capacitor.
8. Now, the high voltage rectifier assembly and the high voltage capacitor should be free.

CAUTION: WHEN REPLACING HIGH VOLTAGE RECTIFIER ASSEMBLY, ENSURE THAT THE CATHODE (EARTH) CONNECTION IS SECURELY FIXED TO THE BASE PLATE THROUGH THE CAPACITOR HOLDER WITH AN EARTHING SCREW.

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

HIGH VOLTAGE TRANSFORMER REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the main wire harness from the high voltage transformer.
3. Disconnect the filament leads and high voltage wire of high voltage transformer from high voltage capacitor and the magnetron.
4. Remove the two (2) screws and one (1) washer holding the transformer to the base plate.
5. Remove the transformer.
6. Now the high voltage transformer is free.

MAGNETRON REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the H.V. wire B and filament lead of the transformer from the magnetron.
3. Carefully remove three (3) screws holding the magnetron to the waveguide, when removing the screws hold the magnetron to prevent it from falling.
4. Remove the one (1) screw holding the magnetron to the chassis support.
5. Remove the magnetron from the waveguide with care so the magnetron antenna is not hit by any metal object around the antenna.
6. Remove the magnetron guide H from the magnetron.
7. Remove the one (1) screw holding the magnetron guide V to the magnetron.
8. Now, the magnetron is free.

CAUTION: WHEN REPLACING THE MAGNETRON, BE SURE THE R.F. GASKET IS IN PLACE AND THE MAGNETRON MOUNTING SCREWS ARE TIGHTENED SECURELY.

CONTROL PANEL ASSEMBLY REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the wire leads and the connectors from the control unit.
3. Remove the one (1) screw holding the earth wire to the oven cavity face plate.
4. Remove the one (1) screw holding the jog panel to the oven cavity face plate.
5. Lift up the control panel assembly and pull it forward. Now the control panel assembly is free.

Jog and Switch unit

6. Disconnect the connector CN-G from the CPU unit.
7. Remove the one (1) screw holding the LCD holder to the jog panel.
8. Remove the four (4) screws holding the power unit to the jog panel.
9. Remove the control unit assembly (CPU unit and Power unit) from the jog panel.
10. Remove the six (6) screws holding the jog and switch unit to the jog panel.
11. Remove the jog and switch unit from the jog panel.
12. Remove the select knob and the time knob from the jog and switch unit.
13. Now, the jog and switch unit is free.

FAN MOTOR REPLACEMENT

REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the one (1) screw holding the noise filter to the chassis support.
3. Release the noise filter from the tabs of the fan duct.
4. Remove the three (3) screw holding the chassis support to the oven cavity front flange, back plate and the magnetron.
5. Remove the chassis support from the oven cavity.
6. Disconnect the wire leads from the fan duct.
7. Remove the one (1) screw holding the fan duct to the back plate.
8. Release the tabs of the fan duct from back plate.
9. Remove the fan duct from the oven.
10. Remove the fan blade from the fan motor shaft according to the following procedure.
    1) Hold the edge of the rotor of the fan motor by using a pair of groove joint pliers.

    CAUTION:
    - **Make sure that no swarf from the rotor enters the gap between the rotor & stator of the fan motor.**
    - **Avoid touch the coil of the fan motor with the pliers as the coil may become cut or damaged.**
    - **Avoid deforming the bracket whilst using the pliers.**

    2) Remove the fan blade assembly from the shaft of the fan motor by pulling and rotating the fan blade with your hand.
    3) Now, the fan blade is free.

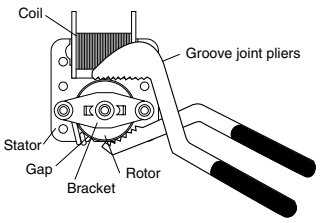
    CAUTION:
    - **Do not re-use the removed fan blade as the fixing hole may be oversize.**
11. Remove the two (2) screws holding the fan motor to the fan duct.
12. Now, the fan motor is free.

INSTALLATION

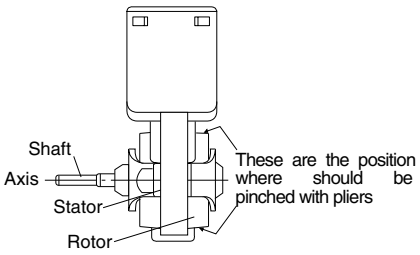
1. **Install the fan motor to the fan duct with the two (2) screws and nuts.**
2. Install the fan blade to the fan motor shaft according to the following procedure.
    1) Hold the centre of the bracket which supports the shaft of the fan motor on a flat table.
    2) Apply the screw lock tight into the hole (for shaft) of the fan blade.
    3) Install the fan blade to the shaft of fan motor by pushing the fan blade with a small, light weight, ball peen hammer or rubber mallet.

    CAUTION:
    - **Do not hit the fan blade when installing because the bracket may be deformed.**
    - **Make sure that the fan blade rotates smoothly after installation.**
    - **Make sure that the axis of the shaft is not slanted.**

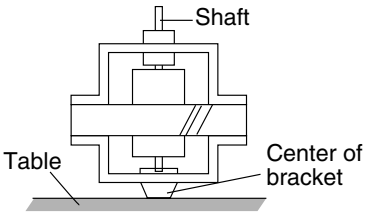
3. Insert the tabs of the fan duct to the back plate.
4. Install the fan duct to the back plate with the one (1) screw.
5. Re-install the chassis support to the oven cavity with the four (4) screws.
6. Install the noise filter to the fan duct and the chassis support with the one (1) screw.
7. Re-connect the wire leads to the fan motor.



Rear view



Side view



TURNTABLE MOTOR REPLACEMENT

Removal

1. Disconnect the oven from the power supply.
2. Remove the turntable and roller stay from the oven cavity.
3. Turn the oven over.
4. Cut the three (3) bridges holding the turntable motor cover to the base plate with cutting pliers as shown in Figure C-1(a).

CAUTION: DO NOT DROP THE TURNTABLE MOTOR COVER INTO THE OVEN AFTER CUTTING THE BRIDGES. BECAUSE IT WILL DAMAGE THE WIRE LEADS OF THE MOTOR AND IT IS DIFFICULT TO REMOVE IT OUT OF THE OVEN.

5. Remove the turntable motor cover from the base plate.
6. Disconnect the wire leads from the turntable motor.
7. Remove the two (2) screws holding the turntable motor to the oven cavity back plate.
8. Remove the turntable motor from the turntable motor angle. Now, the turntable motor is free.

Re-install

1. Remove the any sharp edges on the turntable motor cover and the base plate with the cutting pliers.
2. Re-install turntable motor by locating shaft onto coupling to the oven cavity base plate with the two (2) screws.
3. Re-connect the wire leads to the turntable motor.
4. Insert the one (1) tab of the turntable motor cover into the slit of the base plate as shown in Figure C-1(b).
5. Re-install the turntable motor cover to the base plate with the screw (XHPSD40P08K00) as shown in Figure C-1(b).

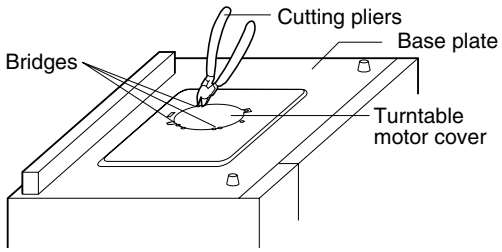


Figure C-1(a). Turntable motor cover removal

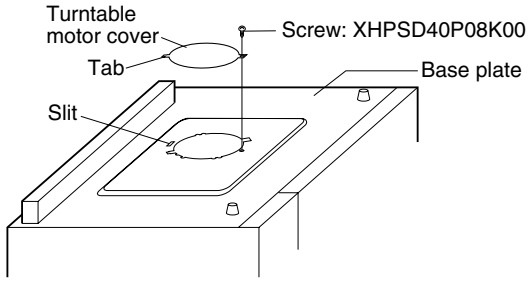


Figure C-1(b). Turntable motor cover re-install

CONVECTION MOTOR AND CONVECTION HEATING ELEMENT REMOVAL

1. CARRY OUT 3D CHECKS.
   Now,the outer case cabinet and the air duct should have been removed.
2. Remove the one (1) screw holding the earth wire of the power supply cord to the back plate.
3. Release the power supply cord from the back plate.
4. Remove the two (2) screws holding the rear barrier to the base plate.
5. Release the three (3) tabs of rear barrier from the base plate. And remove the rear barrier.
6. Remove the one (1) screw holding the back plate to the base plate.
7. Remove the one (1) screw holding the chassis support to the back plate.
8. Remove the one (1) screw holding the the back plate to the air intake duct.
9. Remove the two (2) screws holding the back plate to the convection duct.
10. Remove the back plate from the oven cavity.
11. Disconnect the wire leads from the convection heating elements, convection motor and thermal cut-out.
12. Remove the one (1) screw holding the convection duct to the oven cavity back plate from outside of the oven cvity.
13. Remove the seven (7) screws holding the convection duct to the oven cavity back plate from inside of the oven cvity.
14. Lift up the convection duct and release the three (3) tabs of the oven cavity back plate from the convection duct.
15. Now, the convection unit assembly is free.

CONVECTION HEATING ELEMENT REMOVAL

15. Remove the two (2) screws holding the convection heating element to the convection duct.
16. Remove the one (1) screw holding the convection heater angle to the convection duct.

17. Remove the one (1) screw holding the convection heater angle and the air separate angle D to the convection duct.
18. Remove the one (1) screw holding the convection heater angle A to the convection duct.
19. Remove the convection heating element from the convection duct.
20. Now, the convection heating element is free.

CONVECTION MOTOR REMOVAL

15. Remove the one (1) nut and washer from the convection motor shaft.
16. Remove the convection fan from the convection motor shaft.
17. Remove the pipe from the convection motor shaft.
18. Remove the two (2) screws holding the convection motor angle to the convection duct.
19. Remove the cooling fan from the convection motor shaft.
20. Remove the two (2) screws holding the convection motor to the convection motor angle.
21. Remove the one (1) ring from the convection motor shaft.
22. Now, the convection motor is free.

POSITIVE LOCK® CONNECTOR REMOVAL

1. CARRY OUT 3D CHECKS.
2. Push the lever of positive lock® connector.
3. Pull down on the positive lock® connector.

CAUTION: WHEN YOU (SERVICE ENGINEERS) CONNECT THE POSITIVE LOCK® CONNECTORS TO THE TERMINALS, CONNECT THE POSITIVE LOCK® SO THAT THE LEVER FACES YOU (SERVICE ENGINEERS).

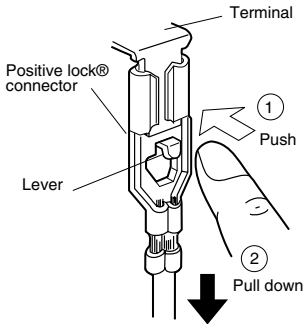


Figure C-2. Positive lock®connector

OVEN LAMP SOCKET REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the wire leads as Positive lock® connector removal above.
3. Lift up the oven lamp from its retaining clips by pushing the tab of the air intake duct.
4. Now, the oven lamp is free.

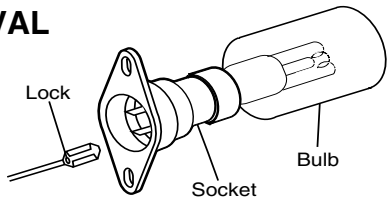


Figure C-3. Oven lamp

POWER SUPPLY CORD REPLACEMENT

Removal

1. CARRY OUT 3D CHECKS.
2. Remove the one (1) screw holding the green/yellow wire to the back plate.
3. Disconnect the leads of the power supply cord from the noise filter, referring to the Figure C-4(a).
4. Release the power supply cord from the rear cabinet.
5. Now, the power supply cord is free.

Re-install

1. Insert the moulding cord stopper of power supply cord into the square hole of the power angle, referring to the Figure C-4(b).
2. Install the earth wire lead of power supply cord to the back plate with one (1) screw and tight the screw.
3. Connect the brown and blue wire leads of power supply cord to the noise filter correctly, referring to the Pictorial Diagram.

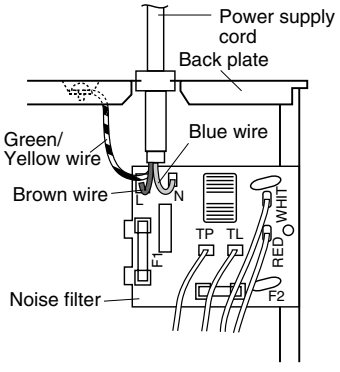


Figure C-4 (a) Replacement of Power Supply Cord

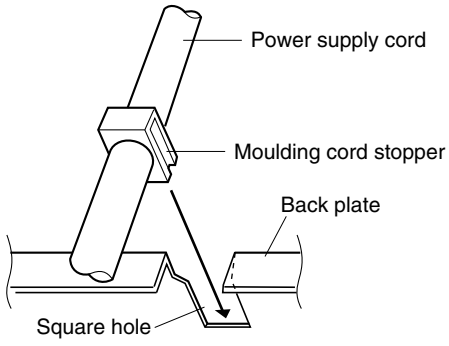


Figure C-4(b). Power Supply Cord Replacement

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

GRILL HEATING ELEMENTS REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect wire leads from the thermal cut-out (GRILL).
3. Remove the two (2) screws holding the AH sensor assembly to the exhaust duct and remove the AH sensor assembly (only for R-963M)
4. Remove the two (2)screws holding the two (2) terminals of the main wire harness to the two (2) grill heating elements.
5. Remove the one (1) screw holding the exhaust duct to the oven cavity top plate.
6. Remove the exhaust duct from the oven cavity top plate.
7. By pushing the two (2) tabs holding the grill reflector to the oven cavity top plate, slide the grill reflector toward the magnetron. And then lift up the grill reflector and remove it.
8. Remove the one (1) screw holding the grill heater angle to the grill heater reflector.
9. Straighten the two (2) tabs of the grill heater angle and remove the grill heater angle from the grill reflector.
10. Remove the two (2) screws holding the earth plate to the two (2) grill heating elements.
11. Remove the two (2) grill heating elements from the grill reflector.
12. Now, the grill heating elements are free.

MONITORED LATCH SWITCH, MONITOR SWITCH AND STOP SWITCH REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the control panel assembly referring to "CONTROL PANEL ASSEMBLY REMOVAL".
3. Disconnect the leads from all switches.
4. Remove the two (2) screws holding the latch hook to the oven cavity.
5. Remove the latch hook.
6. Remove the switch(es) from the latch hook by pushing the retaining tab backwards slightly and turning the switch(es) on the post.
7. Now the switch(es) is free.

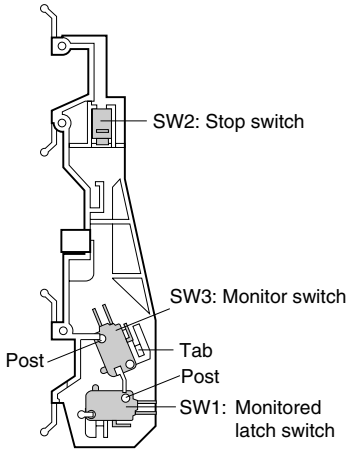


Figure C-5. Switches

MONITORED LATCH SWITCH, STOP SWITCH AND MONITOR SWITCH ADJUSTMENT

If the monitored latch switch, stop switch and monitor switch do not operate properly due to a mis-adjustment, the following adjustment should be made.

1. CARRY OUT 3D CHECKS.
2. Loosen the two (2) screws holding the latch hook to the oven cavity front flange.
3. With the door closed, adjust the latch hook by moving it back and forward or up and down. In and out play of the door allowed by the latch hook should be less than 0.5 mm. The horizontal position of the latch hook should be placed where the monitor switch has activated with the door closed. The vertical position of the latch hook should be placed where the monitored latch switch and stop switch have activated with the door closed.
4. Secure the screws with washers firmly.
5. Make sure of the all switches operation. If the latch head has not pushed the plungers of the monitor switch with door closed, adjust the latch hook position. At that time, the latch head should have pushed the plungers of the monitored latch switch and stop switch. If the latch head has not pushed the plungers of the monitored latch switch and stop switch with door closed, loose two (2) screws holding latch hook to oven cavity front flange and adjust the latch hook position.

After adjustment, make sure of following:

1. In and out play of door remains less than 0.5 mm when latched position. First check the latch hook position, pushing and pulling upper portion of the door toward the oven face. Then check the lower latch hook position, pushing and pulling lower portion of the door toward the oven face. Both results (play of the door) should be less than 0.5mm.
2. The contacts (COM-NO) of the stop switch and the monitored latch switch open within 1.8mm gap between right side of cavity face plate and door when door is opened.
3. When the door is closed, the contacts (COM-NO) of the stop switch close.
4. When the door is closed the contacts (COM-NC) of the monitor switch and monitored latch switch open. And the contacts (COM-NO) of their switches close.
5. Re-install outer case and check for microwave leakage around the door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

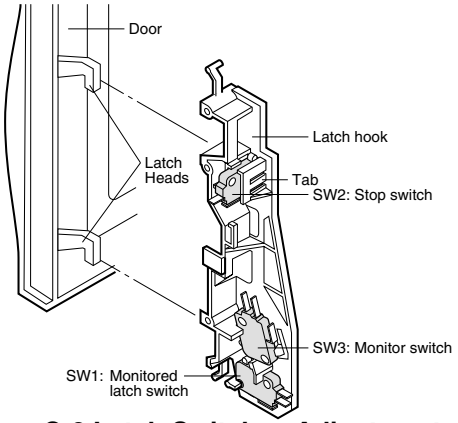


Figure C-6 Latch Switches Adjustment

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

DOOR REPLACEMENT

REMOVAL

1. Disconnect the oven from the power supply.
2. Push the door slightly.
3. Remove the door stopper from the choke cover.
4. Lift the door upwards.
5. Now, door assembly is free from oven cavity.
6. Insert an putty knife (thickness of about 0.5mm) into the gap between the choke cover and door frame as shown in Figure C-7 to free engaging parts.
7. Release choke cover from door panel.
8. Now choke cover is free.

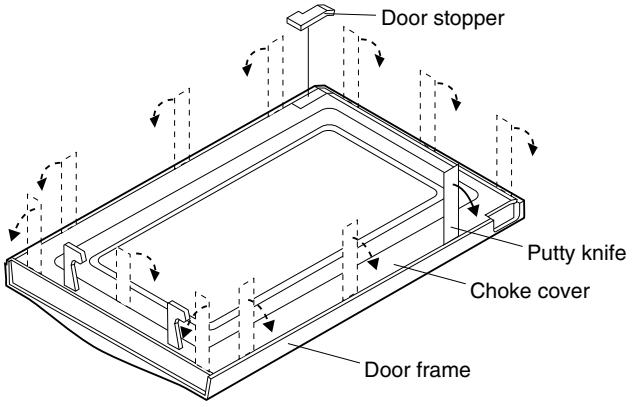


Figure C-7. Door Disassembly

DOOR PANEL

9. Remove the six (6) screws holding the door panel to the door frame.
10. Release door panel from door frame by lifting up the door panel.
11. Now, door panel is free.

LATCH HEAD AND SPRING

CAUTION: DO NOT DEFORM THE TEETH OF COMB OF THE DOOR PANEL TO PREVENT MICROWAVE RADIATION EMISSION FROM THE DOOR.

12. Slide latch head upward and remove it from door frame with releasing latch spring from door frame and latch head.
13. Now, latch head and latch spring are free.

DOOR HANDLE AND FRONT DOOR GLASS

14. Remove the three (3) screws holding the door handle to the door frame.
15. Remove the door handle from the door frame.
16. Slide the front door glass rightwards and then remove it.
17. Now, the front door glass is free

RE-INSTALL

1. Re-install the front door glass to the door frame as follows.
   a) Insert the front door glass into the door frame.
   b) Slide the front door glass leftwards.
2. Re-install the door handle to the door frame as follows.
   a) Insert the door handle to the door frame.
   b) Hold the door handle to the door frame with the three (3) screws.
3. Re-install the latch spring to the latch head. Re-install the latch spring to the door frame. Re-install latch head to door frame.
4. Re-install door panel to door frame.
5. Hold the door panel to the door frame with six (6) screws.
6. Re-install choke cover to door panel by clipping into position.
7. Locate door panel hinge pins into cavity hinge location holes.
8. Re-install the door stopper to the chock cover

Note: After any service to the door;

(A) Make sure that the monitor switch, monitored latch switch and stop switch are operating properly. (Refer to chapter "Test Procedures".).

(B) An approved microwave survey meter should be used to assure compliance with proper microwave radiation emission limitation standards. (Refer to Microwave Measurement Procedure.)

After any service, make sure of the following :

1. Door latch heads smoothly catch latch hook through latch holes and that latch head goes through centre of latch hole.
2. Deviation of door alignment from horizontal line of cavity face plate is to be less than 1.0mm.
3. Door is positioned with its face pressed toward cavity face plate.
4. Check for microwave leakage around door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

Note: The door on a microwave oven is designed to act as an electronic seal preventing the leakage of microwave energy from oven cavity during cook cycle. This function does not require that door be air-tight, moisture (condensation)-tight or light-tight. Therefore, occasional appearance of moisture, light or sensing of gentle warm air movement around oven door is not abnormal and do not of themselves, indicate a leakage of microwave energy from oven cavity.

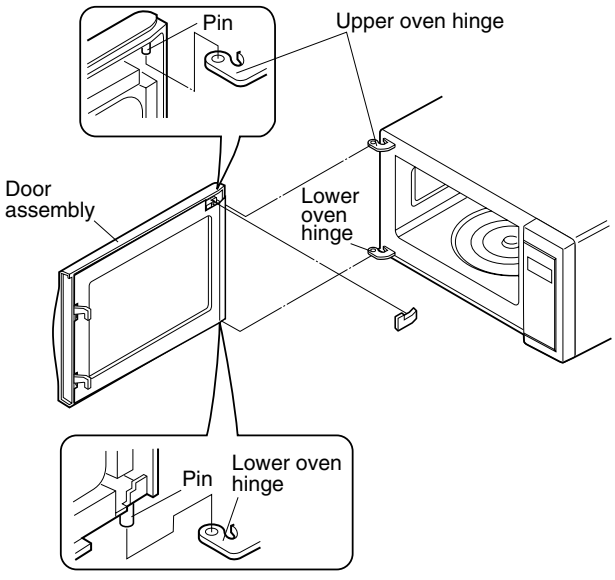


Figure C-8. Door Replacement

MICROWAVE MEASUREMENT

After adjustment of door latch switches, monitor switch and door are completed individually or collectively, the following leakage test must be performed with a survey instrument and it must be confirmed that the result meets the requirements of the performance standard for microwave oven.

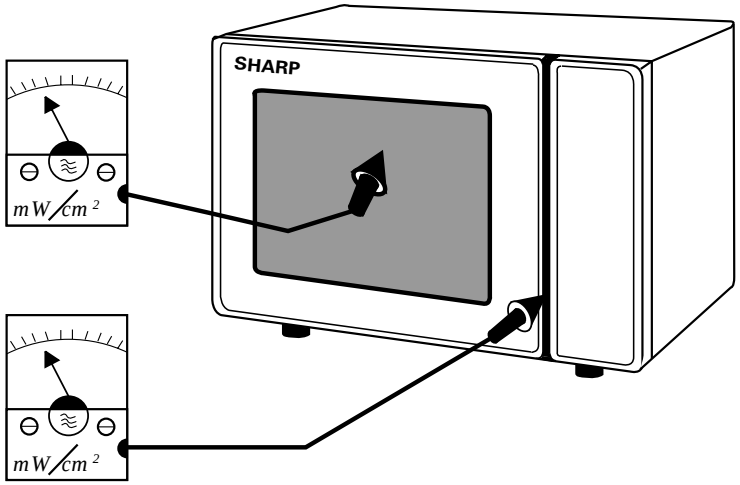
REQUIREMENT

The safety switch must prevent microwave radiation emission in excess of 5mW/cm^2 at any point 5cm or more from external surface of the oven.

PREPARATION FOR TESTING:

Before beginning the actual test for leakage, proceed as follows;

1. Make sure that the test instrument is operating normally as specified in its instruction booklet.
   Important:
   Survey instruments that comply with the requirement for instrumentations as prescribed by the performance standard for microwave ovens must be used for testing.
   Recommended instruments are:
   NARDA 8100
   NARDA 8200
   HOLADAY HI 1500
   SIMPSON 380M
2. Place the oven tray into the oven cavity.
3. Place the load of 275 ± 15ml of water initially at 20 ± 5˚C in the centre of the oven tray. The water container should be a low form of 600 ml beaker with inside diameter of approx. 8.5cm and made of an electrically non-conductive material such as glass or plastic.
   The placing of this standard load in the oven is important not only to protect the oven, but also to insure that any leakage is measured accurately.
4. Close the door and turn the oven ON with the timer set for several minutes. If the water begins to boil before the survey is completed, replace it with 275ml of cool water.
5. Move the probe slowly (not faster that 2.5cm/sec.) along the gap.
6. The microwave radiation emission should be measured at any point of 5cm or more from the external surface of the oven.



Microwave leakage measurement at 5 cm distance

TEST DATA AT A GLANCE

PARTS	SYMBOL	VALUE / DATA
Fuse	F1	20A / 250V
Fuse	F2	F 8A
Thermal cut-out	TC1	125°C Off
Thermal cut-out	TC2, TC3	170°C Off / 155˚C On
Thermistor		Approx. 359.9 k Ω - 152 kΩ at 20˚C - 30˚C
Grill heating element	GH	Approx. 44.4 Ω (22.2 x 2)/ Insulation resistance > 10 MΩ
Convection heating element	CH	Approx. 42.5 Ω / Insulation resistance > 10 MΩ
Oven lamp	OL	240–250 V 25W
High voltage capacitor	C	AC 2100V 1.16μF
Magnetron	MG	Filament < 1Ω / Filament – chassis ∞ ohm.
High voltage transformer	T	Filament winding < 1Ω Secondary winding Approx. 127 Ω / Primary winding Approx. 2 Ω

WARNING: DISCONNECT THE PLUG WHEN MEASURING RESISTANCE.

SCHEMATICS

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. PLUGGED IN OVEN.
3. NOTHING APPEARS ON DISPLAY.

Note:
AC CORD CONNECTION
BRN : BROWN
BLU : BLUE
G-Y : GREEN AND YELLOW STRIPE
/15 : SECTIONAL AREA OF 1.5mm² MIN.
"★" Indicates components with potential above 250 V.

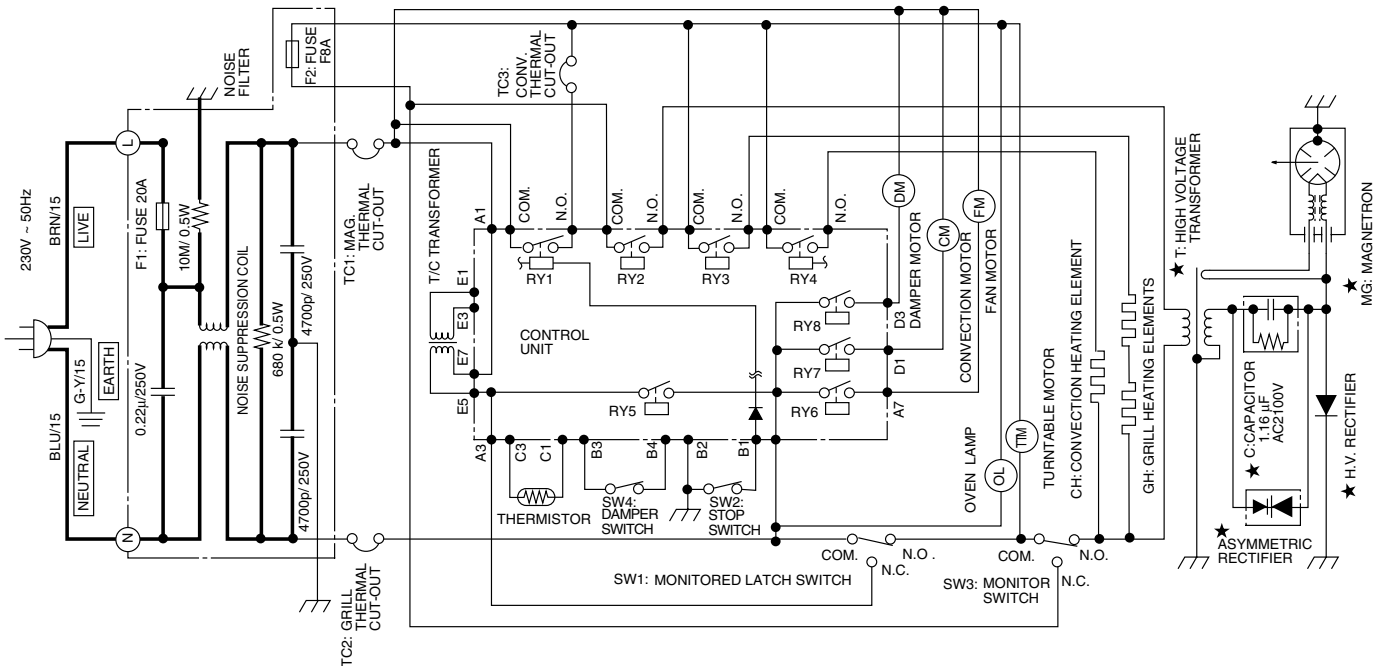


Figure O-1(a) Oven Schematic-OFF Condition right after the oven is plugged in.

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. "ENERGY SAVED MODE APPEARS ON DISPLAY.

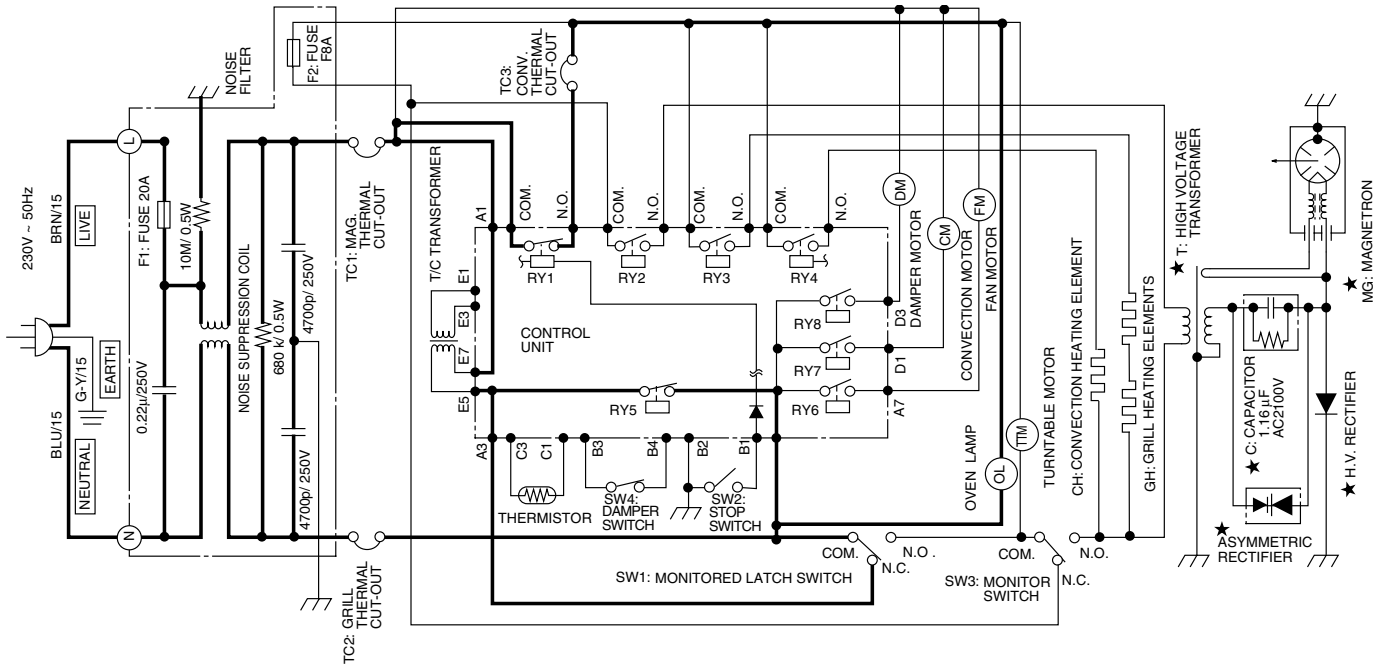


Figure O-1(b) Oven Schematic-OFF Condition when the oven door is opened.

SCHEMATICS

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
3. " . O" APPEARS ON DISPLAY.

Note:
AC CORD CONNECTION
BRN : BROWN
BLU : BLUE
G-Y : GREEN AND YELLOW STRIPE
/15 : SECTIONAL AREA OF 1.5mm² MIN.
"★" Indicates components with potential above 250 V.

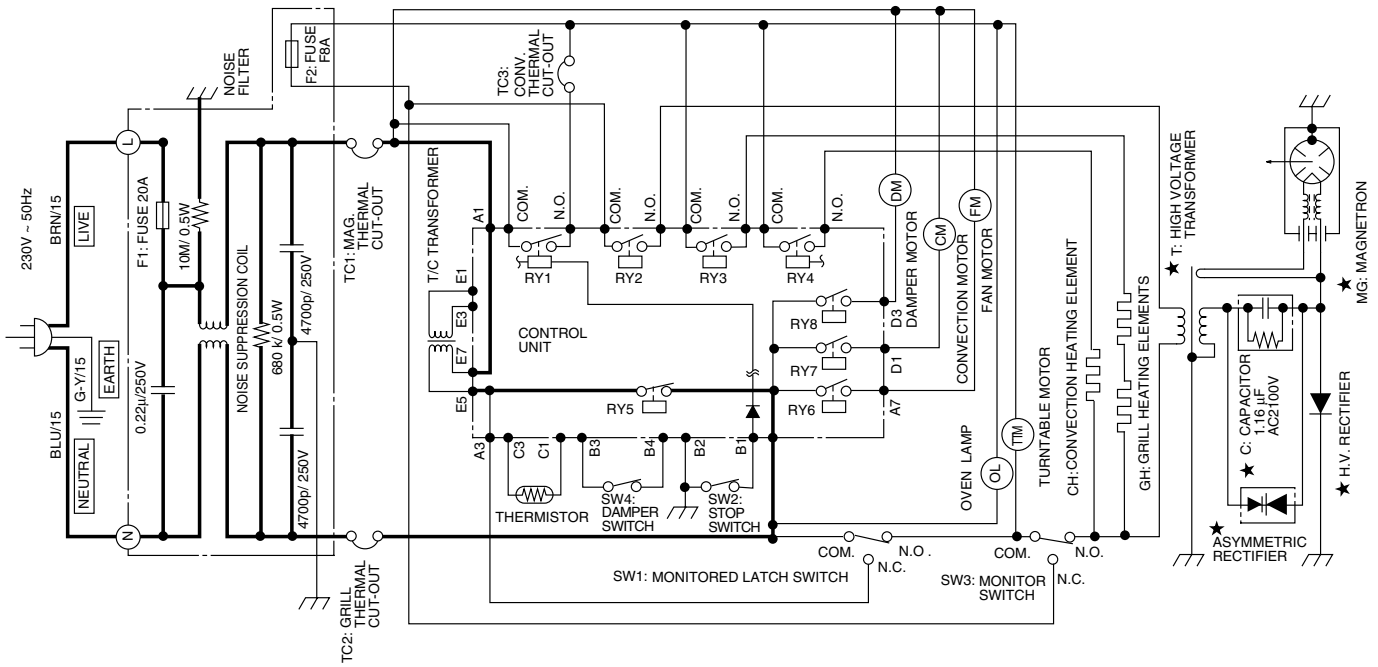


Figure O-1(c) Oven Schematic-OFF Condition after the oven door is closed.

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. MICROWAVE MODE SET
3. COOKING TIME SET.
4. STRAT BUTTON PRESSED.

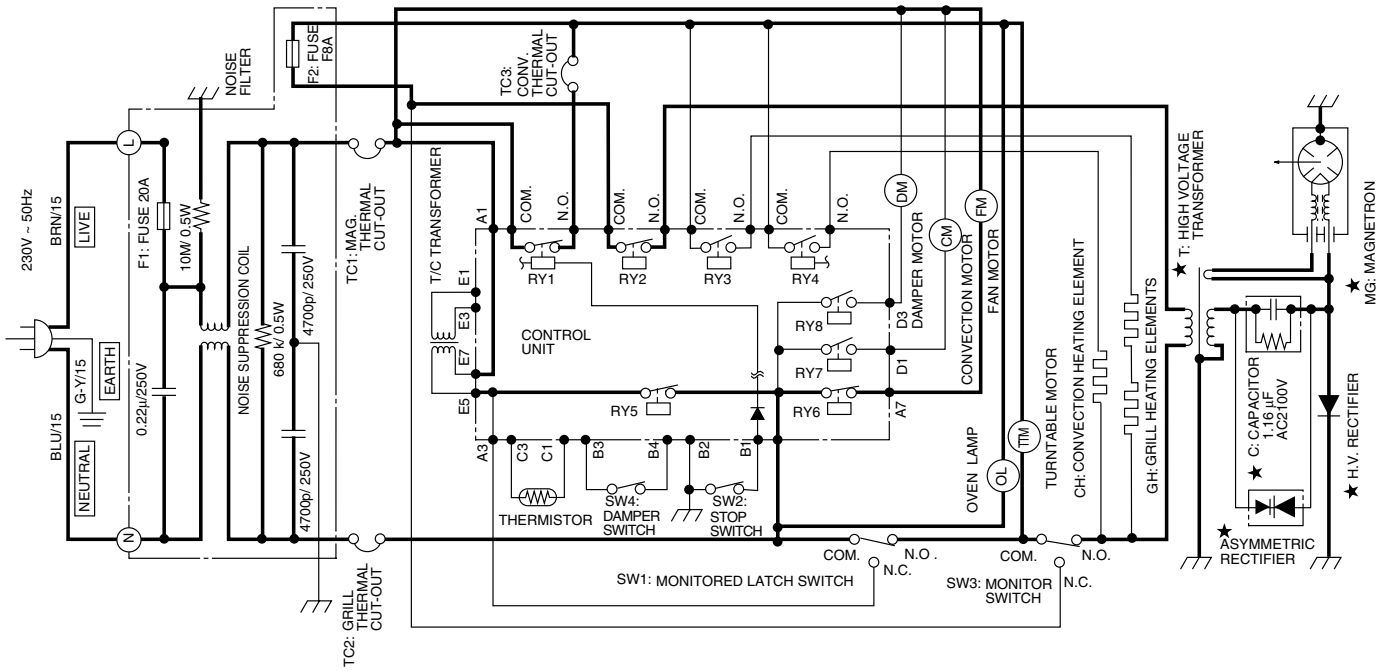


Figure O-2 Oven Schematic-Microwave cooking Condition

SCHEMATICS

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. GRILL MODE SET.
3. COOKING TIME SET.
4. STRAT BUTTON PRESSED.

NOTE: The convection cooking will be curried out as back up until the oven cavity temperature rises to 220 ˚C.

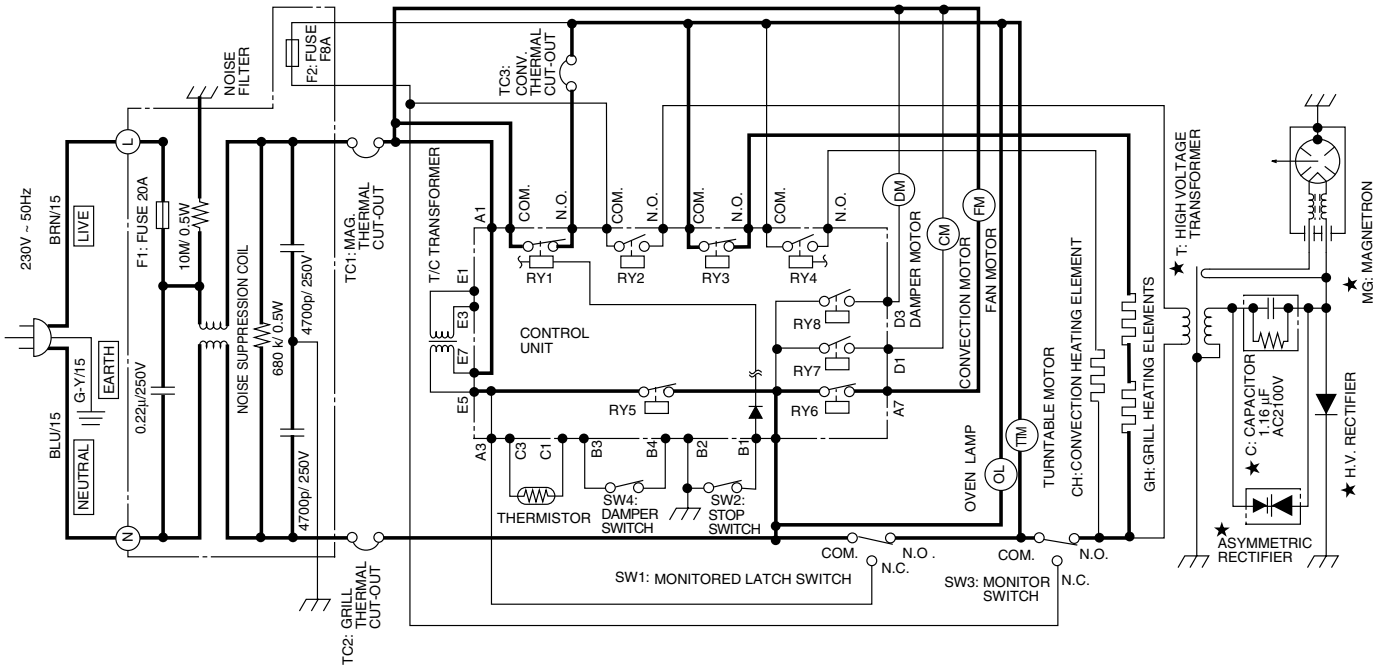


Figure O-3 Oven Schematic-Grill cooking Condition (TOP GRILL mode)

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. CONVECTION MODE SET
3. COOKING TIME SET.
4. CONVECTION TEMPERATURE SELECTED.
5. STRAT BUTTON PRESSED.

NOTE: When the convection temperature 160 - 250 ˚C are selected, the grill heating element will be energized as back up.

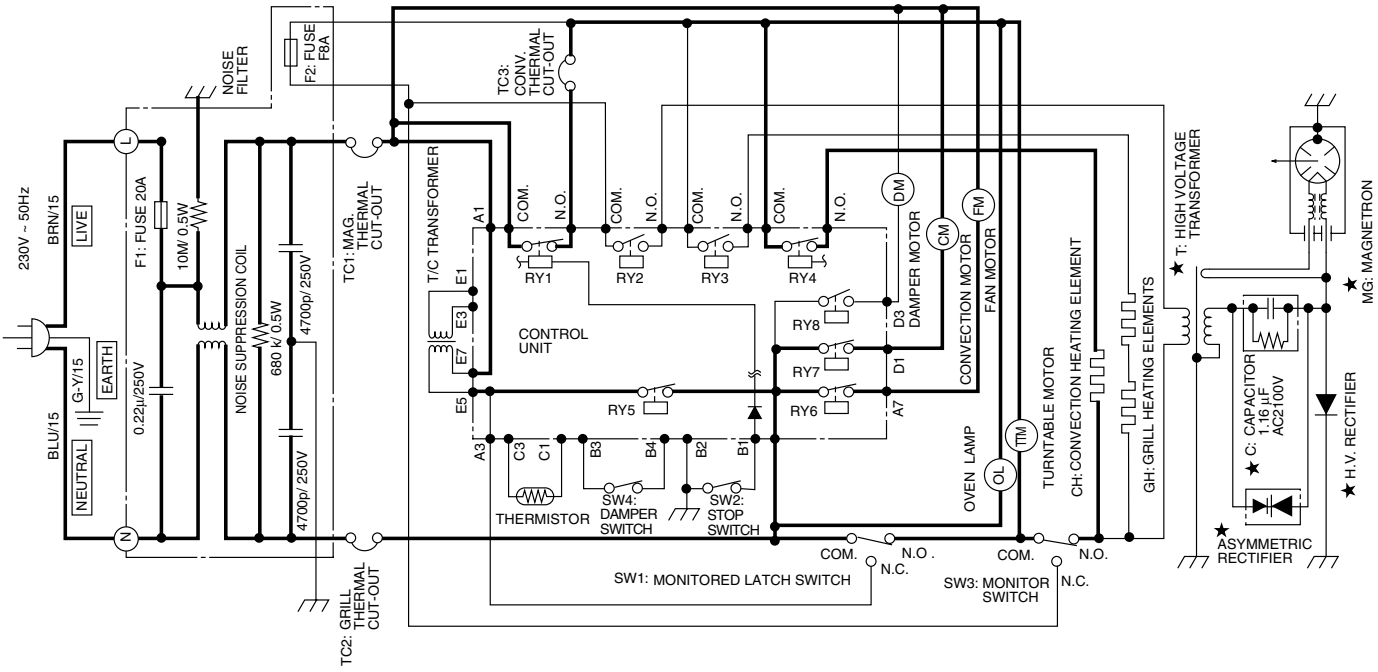


Figure O-4 Oven Schematic-Convection Condition

SCHEMATICS

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. DUAL 1 MODE SET.
3. COOKING TIME SET.
4. MICROWAVE POWER LEVEL SET.
5. CONVECTION TEMPERATURE SELECTED.
6. STRAT BUTTON PRESSED.

Note:
AC CORD CONNECTION
BRN : BROWN
BLU : BLUE
G-Y : GREEN AND YELLOW STRIPE
/15 : SECTIONAL AREA OF 1.5mm² MIN.
"★" Indicates components with potential above 250 V.

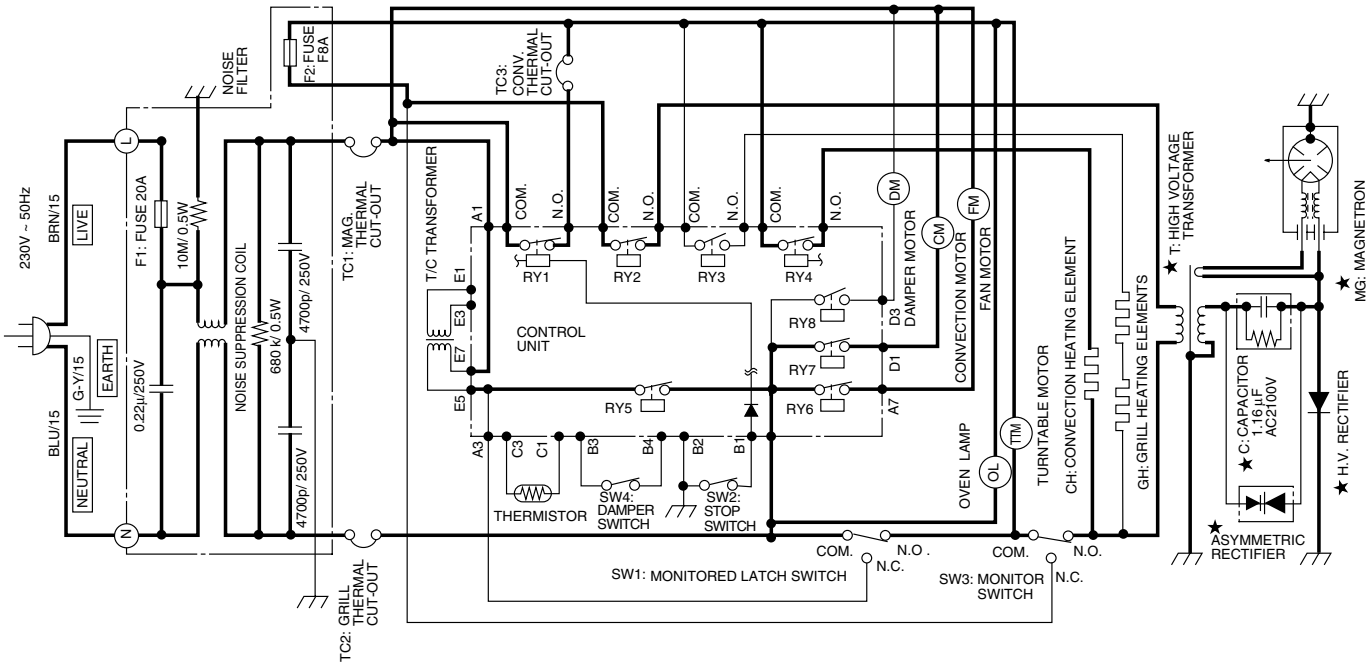


Figure O-5(a) Oven Schematic-Dual cooking Condition (Microwave and Convection)

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. DUAL 2 MODE SET.
3. COOKING TIME SET.
4. MICROWAVE POWER LEVEL SET.
5. STRAT BUTTON PRESSED.

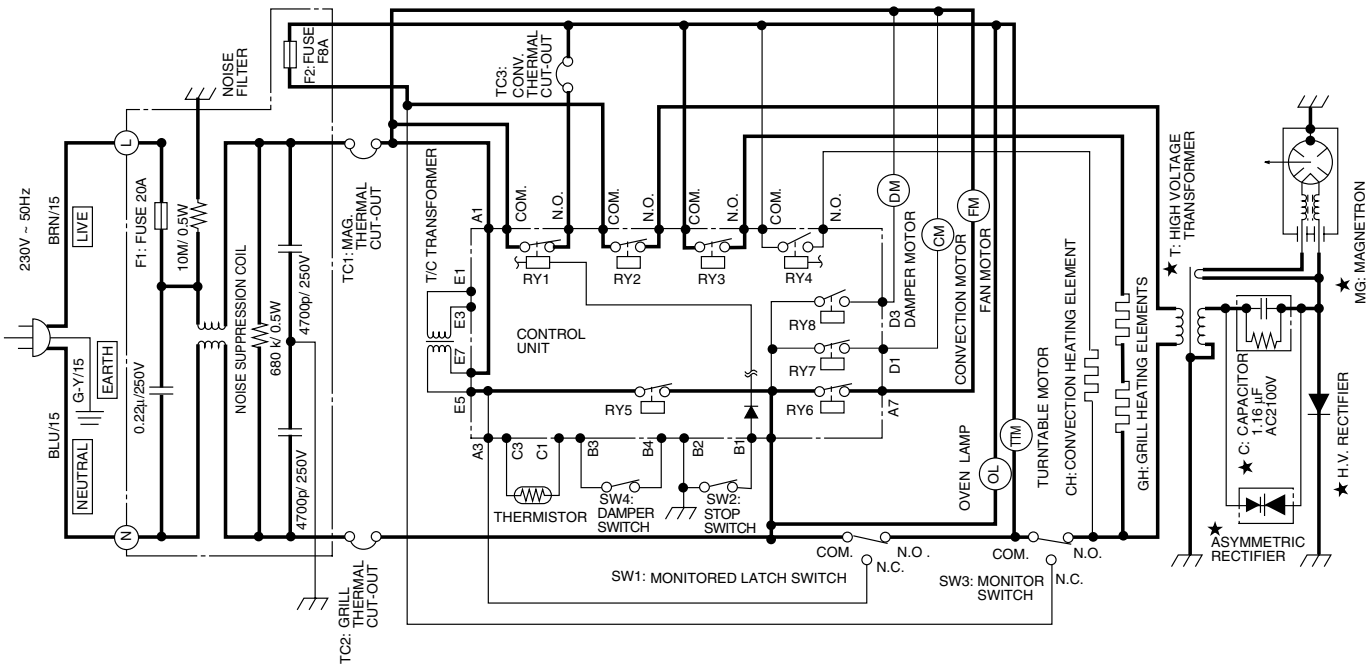


Figure O-5(b) Oven Schematic-Dual cooking Condition (Microwave and Grill)

PICTORIAL DIAGRAM

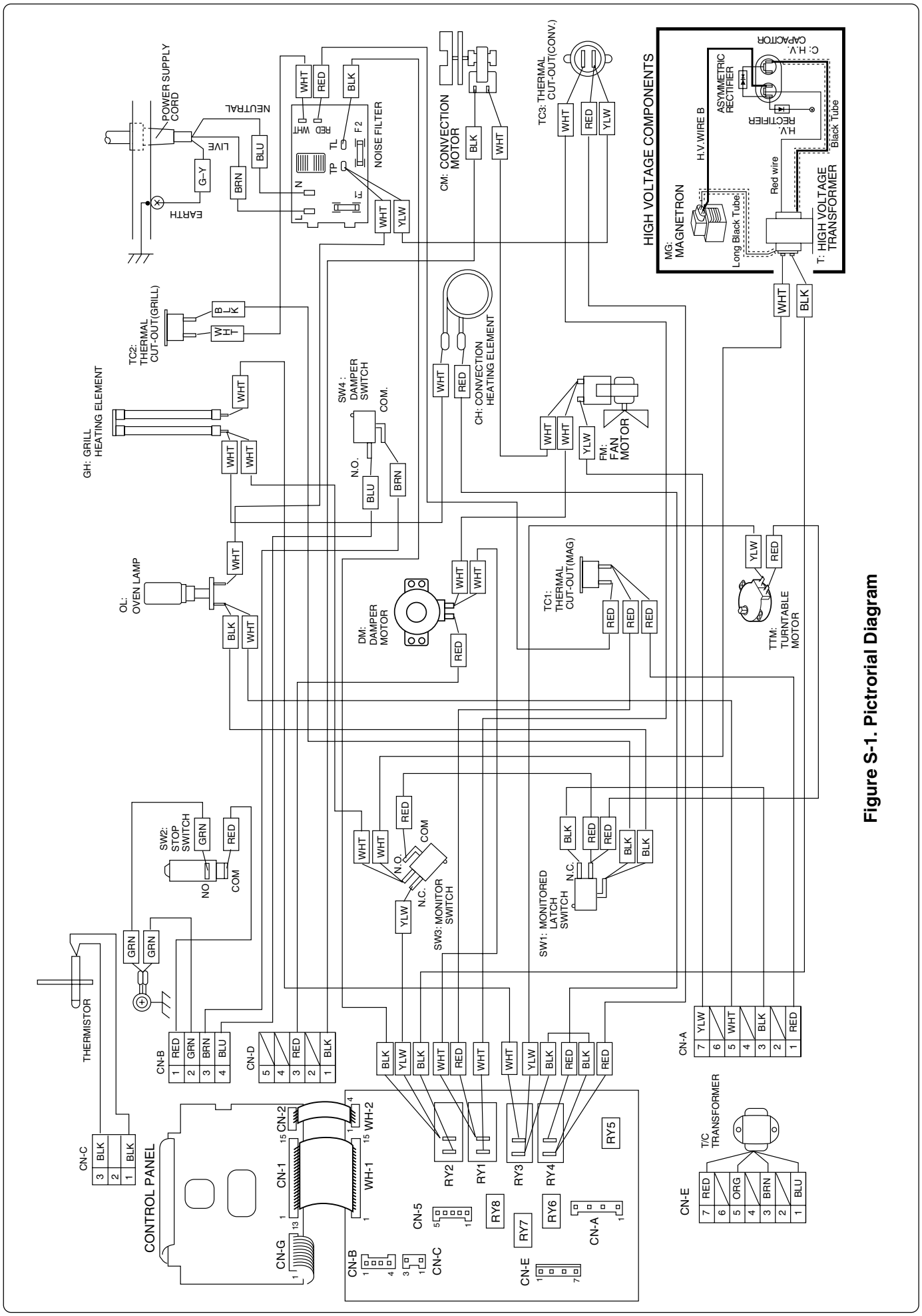
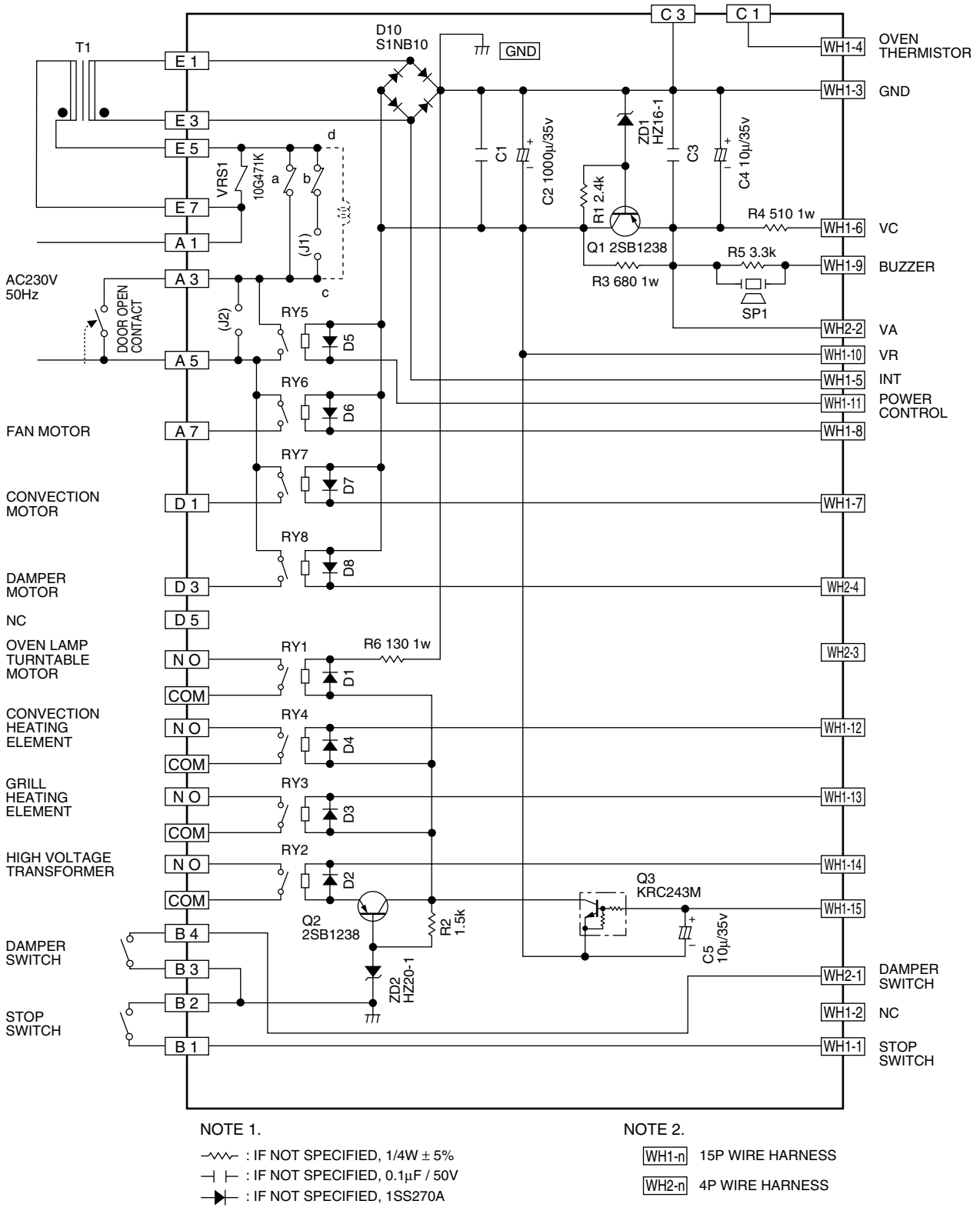


Figure S-1. Pictrorial Diagram

POWER UNIT CIRCUIT



NOTE 1.

: IF NOT SPECIFIED, 1/4W ± 5%

: IF NOT SPECIFIED, 0.1µF / 50V

: IF NOT SPECIFIED, 1SS270A

NOTE 2.

WH1-n 15P WIRE HARNESS

WH2-n 4P WIRE HARNESS

Figure S-2. Power Unit Circuit

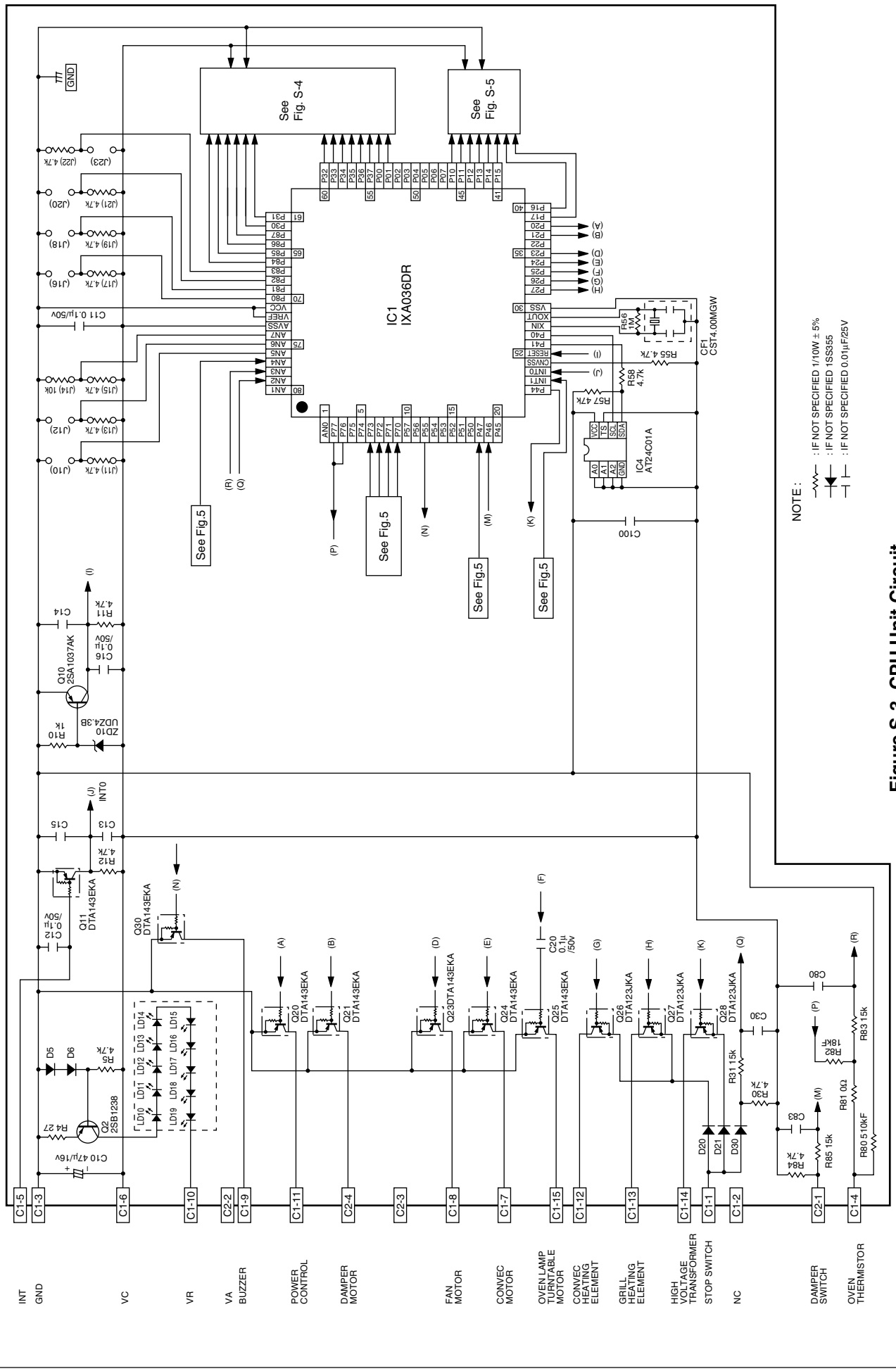


Figure S-3. CPU Unit Circuit

INDICATOR CIRCUIT

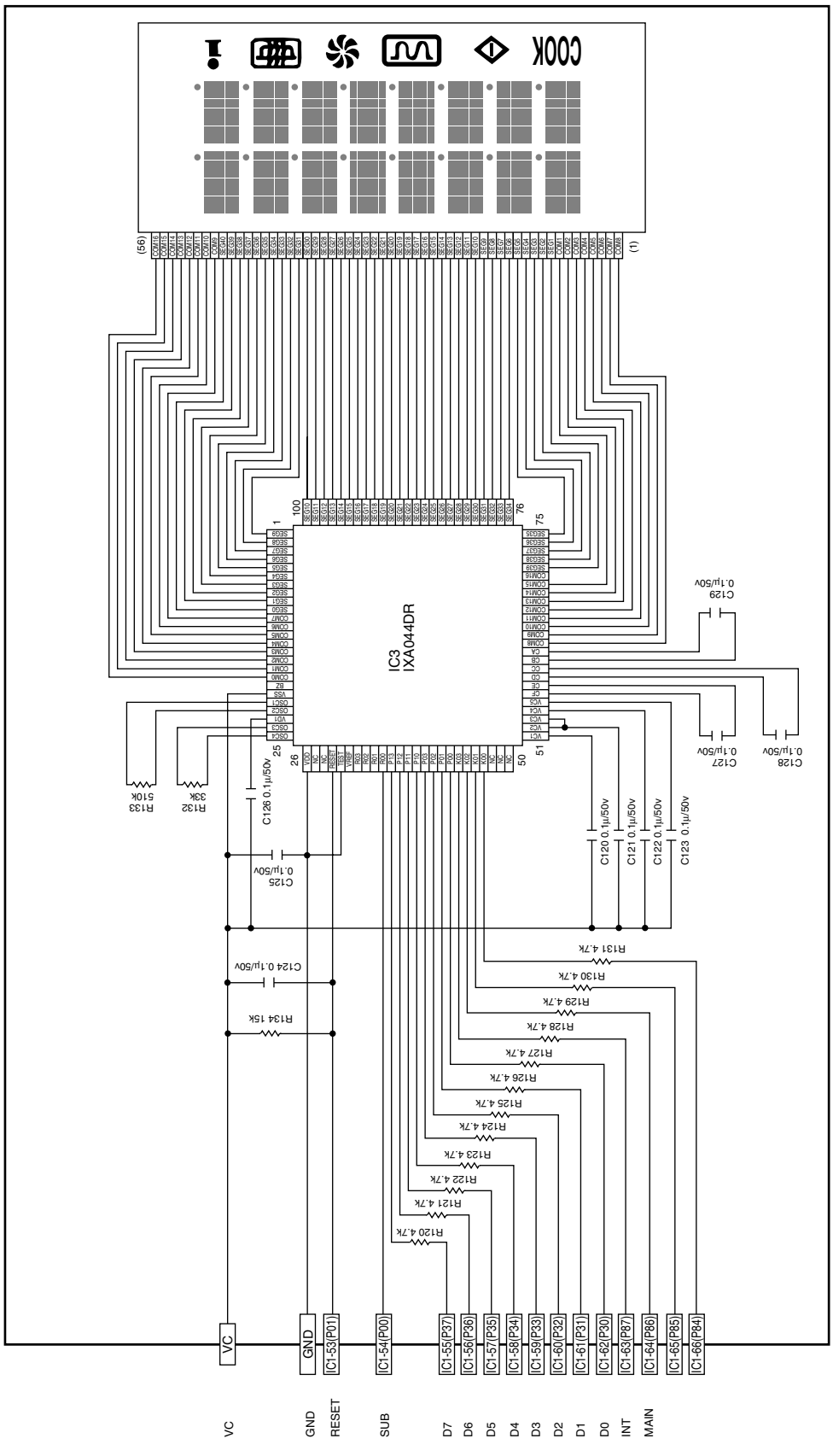


Figure S-4. Indicator Circuit

JOG AND SWITCH UNIT CIRCUIT

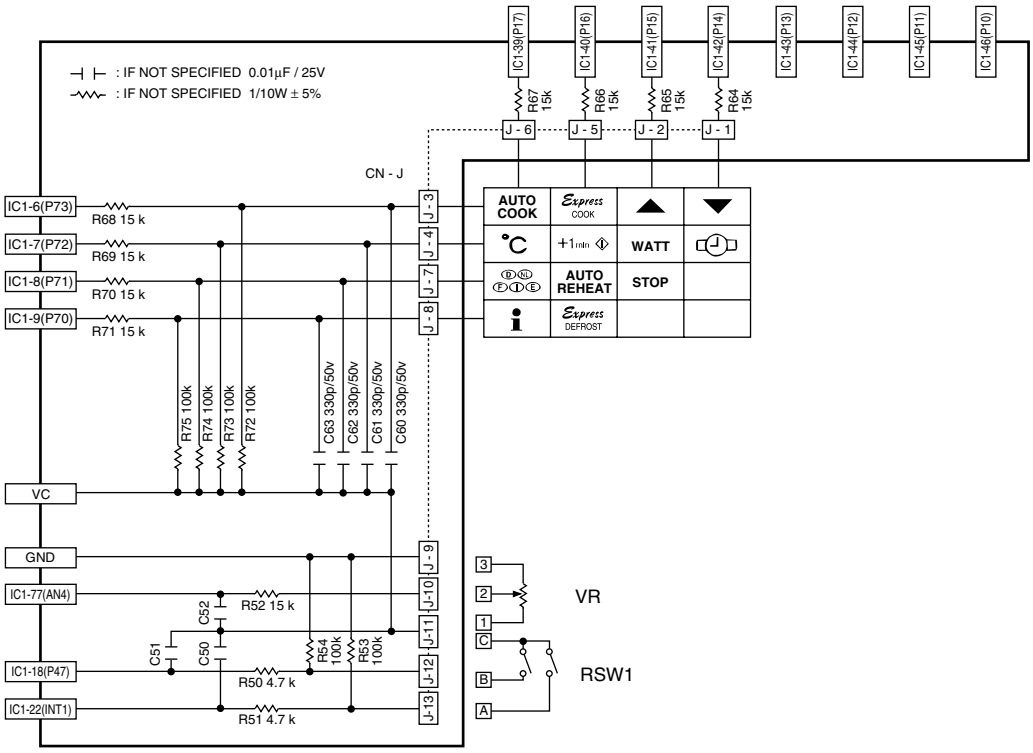


Figure S-5(a). Jog and Switch Circuit

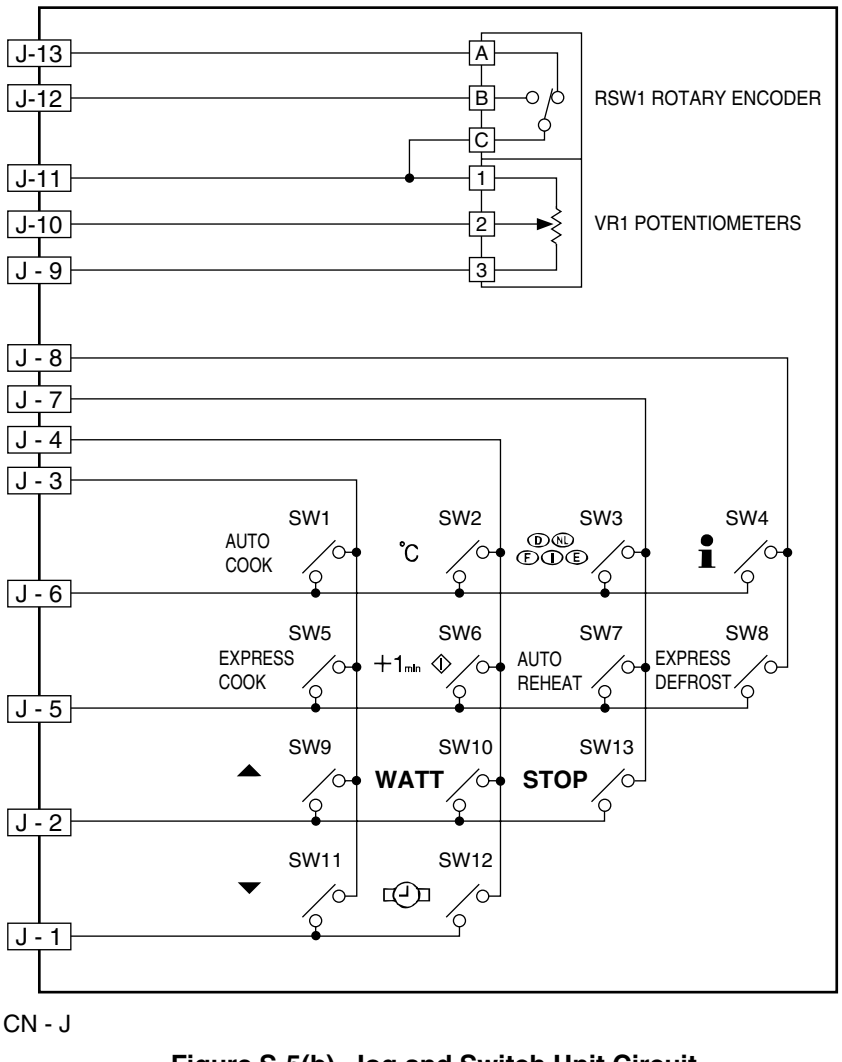


Figure S-5(b). Jog and Switch Unit Circuit

PRINTED WIRING BOARD OF POWER UNIT

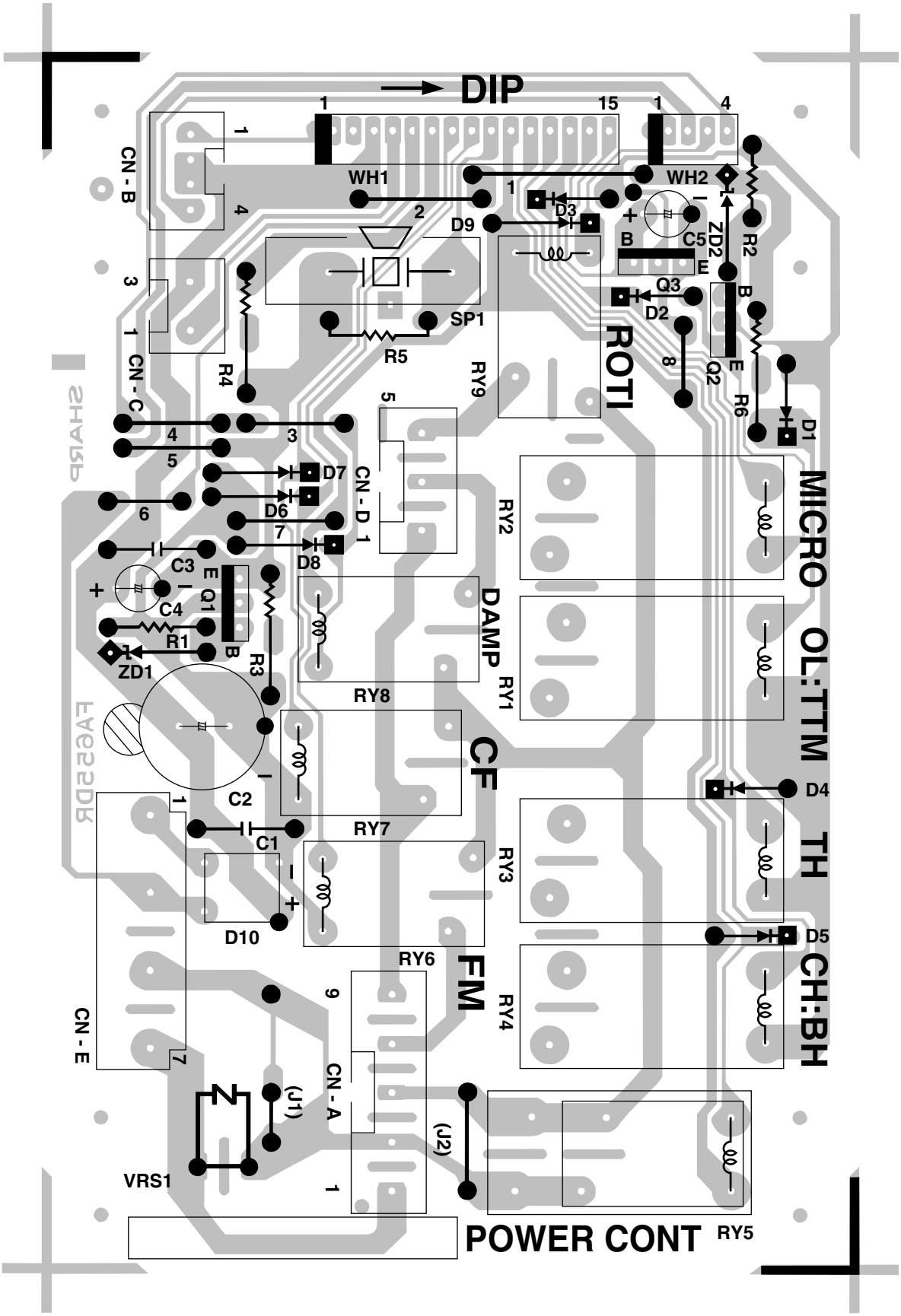


Figure S-6. Printed Wiring Board of Power Unit

PRINTED WIRING BOARD OF JOG AND SWITCH UNIT

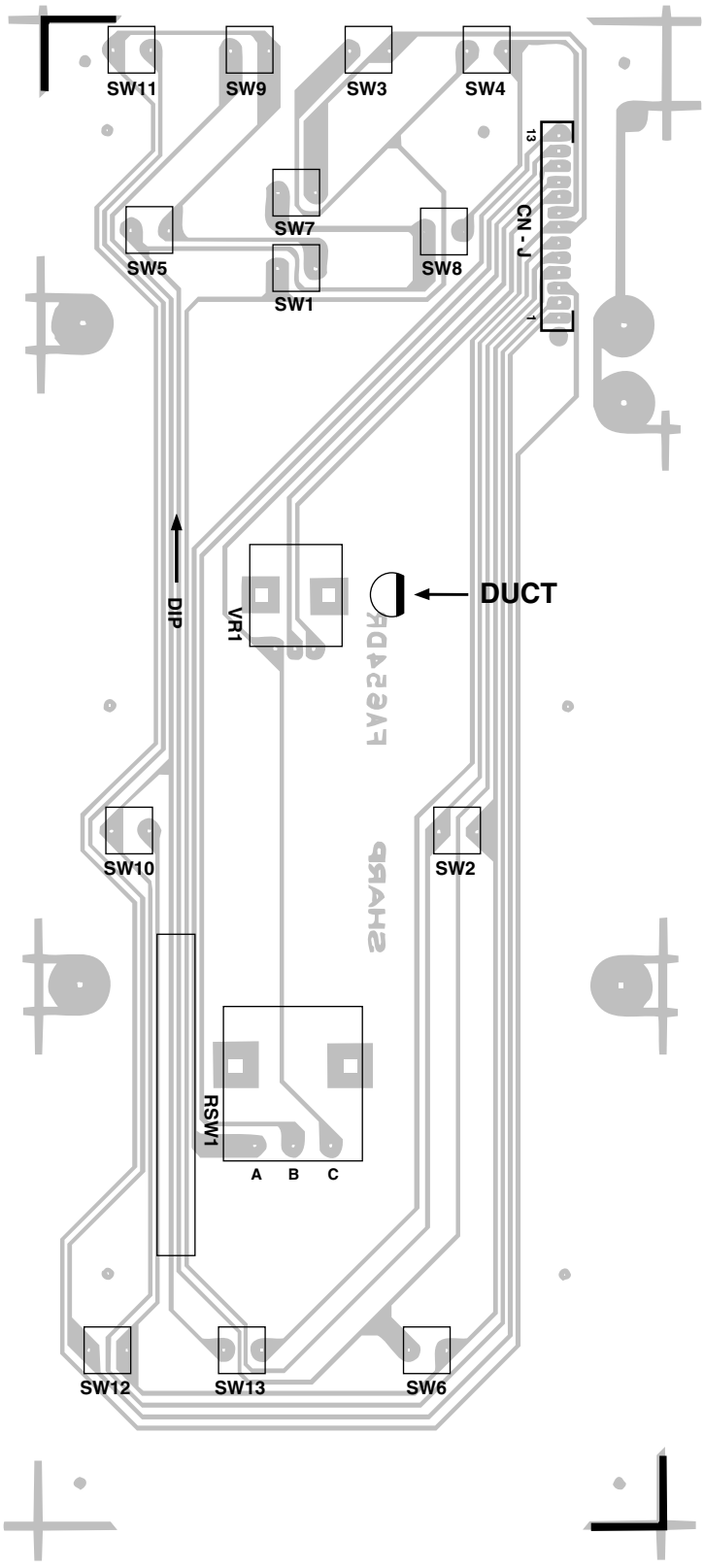


Figure S-7. Printed Wiring Board of Jog and Switch Unit

PARTS LIST

Note: The parts marked "Δ" may cause undue microwave exposure. / The parts marked "*" are used in voltage more than 250V. / "§" Mark: Spare parts delivery section

	REF. NO.	PART NO.	§	DESCRIPTION	Q'TY	CODE
				ELECTRIC PARTS		
*	C	RC-QZA219WRE0	U	High voltage capacitor	1	AT
	CH	RHET-A233WRZZ	U	Convection heating element	1	AU
	CM	RMOTEA373WRE0	U	Convection motor	1	AV
	DM	RMOTDA191WRE0	J	Damper motor	1	AS
	F1	QFS-BA009WRE0	U	Fuse 20A	1	AC
	F2	QFS-CA025WRE0	U	Fuse F8A	1	AC
	FM	RMOTEA361WRE0	U	Fan motor	1	AT
Δ*	GH	RHET-A231WRZZ	U	Grill heating element	2	AQ
	MG	RV-MZA264WRE0	U	Magnetron	1	BK
	OL	RLMPTA066WRE0	U	Oven lamp	1	AK
	SW1	QSW-MA133WRE0	U	Monitored latch switch	1	AN
	SW2	QSW-MA131WRE0	U	Stop switch	1	AK
	SW3	QSW-MA133WRE0	U	Monitor switch	1	AN
	SW4	QSW-MA131WRE0	U	Damper switch	1	AK
*	T	RTRN-A016URE1	U	High voltage transformer	1	BE
	TC1	RTHM-A098WRE0	U	Thermal cut-out 125˚C (MG)	1	AK
	TC2	RTHM-A109WRE0	U	Thermal cut-out 170˚C (GRILL)	1	AM
	TC3	RTHM-A109WRE0	U	Thermal cut-out 170˚C (CONV.)	1	AM
	TTM	RMOTDA227WRE0	U	Turntable motor	1	AU
*	1- 1	FH-DZA035WRE0	U	High voltage rectifier assembly	1	AP
	1- 2	QACCVA004URE2	U	Power supply cord	1	AQ
	1- 3	FPWBFA309WRE2	U	Noise filter	1	AT
	1- 4	RTRN-A529WRE0	U	TC transformer	1	AV
	1- 5	FH-HZA075WRE0	U	Thermistor	1	AN
				CABINET PARTS		
	2- 1	GCABDA005URP0	U	Back plate	1	AU
	2- 2	GCABUA038URP0	U	Outer case cabinet [R-933(IN)]	1	AU
	2- 2	GCABUA037URP0	U	Outer case cabinet [R-933(W)]	1	AU
	2- 3	GLEGPA028WRE0	U	Foot	2	AA
	2- 4	GDAI-A003URP0	U	Base plate	1	AT
				CONTROL PANEL PARTS		
	3- 1	DPWBFA129URK0	U	Power unit	1	BF
	3- 1A	QCNCMA412DRE0	U	4-pin connector (CN-A)	1	AD
	3- 1B	QCNCMA433DRE0	U	4-pin connector (CN-B)	1	AM
	3- 1C	QCNCMA410DRE0	U	2-pin connector (CN-C)	1	AB
	3- 1D	QCNCMA430DRE0	U	3-pin connector (CN-D)	1	AC
	3- 1E	QCNCMA230DRE0	U	4-pin connector (CN-E)	1	AC
	3- 1F	FW-VZA266DREZ	U	15-pin wire harness (WH-1)	1	AC
	3- 1G	FW-VZA267DREZ	U	4-pin wire harness (WH-2)	1	AC
	C1	RC-KZA087DRE0	U	Capacitor 0.1 uF 50V	1	AB
	C2	VCEAG31VW108M	U	Capacitor 1000 uF 35V	1	AE
	C3	RC-KZA087DRE0	U	Capacitor 0.1 uF 50V	1	AB
	C4-5	VCEAG31VW106M	U	Capacitor 10 uF 35V	2	AB
	D1-8	VHD1SS270A/-1	U	Diode (1SS270A)	8	AA
	D10	RSRCDA013DRE0	U	Diode bridge (S1NB10)	1	AE
	Q1-2	VS2SB1238//-3	U	Transistor (2SB1238)	2	AD
	Q3	VSKRC243M//-3	U	Transistor (KRC243M)	1	AB
	R1	VRD-B12EF242J	U	Resistor 2.4K ohm 1/4W	1	AA
	R2	VRD-B12EF152J	U	Resistor 1.5K ohm 1/4W	1	AA
	R3	VRS-B13AA681J	U	Resistor 680 ohm 1W	1	AB
	R4	VRS-B13AA511J	U	Resistor 510 ohm 1W	1	AB
	R5	VRD-B12EF332J	U	Resistor 3.3K ohm 1/4W	1	AA
	R6	VRS-B13AA131J	U	Resistor 130 ohm 1W	1	AB
	RY1	RRLY-A117DRE0	U	Relay (DU18D1-1P(M)-R)	1	AG
	RY2	RRLY-A122DREO	U	Relay (DU18D1-1P(M)-R-S)	1	AG
	RY3-4	RRLY-A113DRE0	U	Relay (DU24D1-1P(M)-R)	2	AG
	RY5-8	RRLY-A080DRE0	U	Relay (OJ-SH-124LM)	4	AG
	SP1	RALM-A014DRE0	U	Buzzer (PKM22EPT)	1	AG
	VRS1	RH-VZA034DRE0	U	Varistor (10G471K)	1	AD
	ZD1	VHEHZ161///-1	U	Zener diode (HZ16-1)	1	AB
	ZD2	VHEHZ201///-1	U	Zener diode (HZ20-1)	1	AB
	3- 2	DPWBFC038WRKZ	U	CPU unit	1	BC
	3- 3	LHLD-A010URF0	U	LED holder	1	AM
	3- 4	PSHEPA647WRE0	U	LCD sheet	1	AL
	3- 5	FPWBFA055URK0	U	Jog and switch unit	1	AW
	3- 5-1	RVR-BA018WRE0	U	Rotary encoder (RSW1)	1	AH
	3- 5-2	RVR-BA014DRE0	U	Potentiometers (VR1)	1	AD
	3- 5-3	QSW-PA016DRE0	U	Tact switch (SW1-SW13)	13	AB
	3- 5-4	QW-QZA010URE0	U	13pin wire harness (CN-J)	1	AG

PARTS LIST

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	REF. NO.	PART NO.	§	DESCRIPTION	Q'TY	CODE
	3- 6	HPNLCK010URR0	U	Jog panel [R-933(IN)]	1	AQ
	3- 6	HPNLCS017URR0	U	Jog panel [R-933(W)]	1	AQ
	3- 7	GMADIA022URR0	U	Display window [R-933(W)]	1	AG
	3- 7	GMADIA023URR0	U	Display window [R-933(IN)]	1	AG
	3- 8	JBTN-K025URF0	U	More/Less button [R-933(IN)]	1	AE
	3- 8	JBTN-R011URF0	U	More/Less button [R-933(W)]	1	AE
	3- 9	JBTN-L014URR0	U	Express/Defrost button [R-933(IN)]	1	AE
	3- 9	JBTN-R012URR0	U	Express/Defrost button [R-933(W)]	1	AE
	3- 10	JBTN-K024URR0	U	Stop/Watt button [R-933(IN)]	1	AE
	3- 10	JBTN-R013URR0	U	Stop/Watt button [R-933(W)]	1	AE
	3- 11	JKNBKK009URF0	U	Select knob [R-933(IN)]	1	AC
	3- 11	JKNBKR006URF0	U	Select knob [R-933(W)]	1	AC
	3- 12	JKNBKK010URF0	U	Timer knob [R-933(IN)]	1	AC
	3- 12	JKNBKR008URF0	U	Timer knob [R-933(W)]	1	AC
	3- 13	MSPR-A006WREZ	U	Switch spring	1	AB
	3- 14	HPNLCS016URT0	U	Control panel frame [R-933(IN)]	1	AU
	3- 14	HPNLCW052URF0	U	Control panel frame [R-933(W)]	1	AU
	3- 15	XEPSD30P10XS0	U	Screw : 3mm x 10mm	11	AA

OVEN PARTS

	4- 1	PSKR-A011URP0	U	Magnetron guide H	1	AN
Δ	4- 2	PCUSUA026URP0	U	Cushion B	1	AB
	4- 3	PSKR-A009URP0	U	Magnetron guide V	1	AB
	4- 4	DOVN-A018URK0	U	Oven cavity	1	BL
	4- 5	MCAMPA001URF0	U	Damper cam	1	AD
	4- 6	LANGTA009URP0	U	Damper angle	1	AC
	4- 7	PFTA-A001URF0	U	Damper	1	AD
	4- 8	PCUSUA025URP0	U	Cushion A	1	AC
	4- 9	PDUC-A011URF0	U	Air intake duct	1	AE
	4-10	PDUC-A014URP0	U	Exhaust duct	1	AM
	4-11	PSKR-A010URP0	U	Partition plate B	1	AD
	4-12	PDUC-A012URP0	U	Air duct	1	AG
	4-13	LANGQA017URP0	U	Grill heater angle	1	AB
	4-14	QTANNA001URP0	U	Earth plate	1	AB
	4-15	PREFHA001URP0	U	Grill reflector	1	AN
	4-16	LANG-A054WRP0	U	Convection heater angle	2	AB
	4-17	LANGQA308WRP0	U	Convection motor angle	1	AE
	4-18	NFANMA003URP0	U	Cooling fan	1	AP
	4-19	PDUC-A013URP0	U	Convection duct	1	AN
	4-20	PPIPFA013WRE0	U	Pipe	1	AE
	4-21	PSKR-A002URP0	U	Air separate angle A	1	AM
	4-22	PSKR-A003URP0	U	Air separate angle B	1	AC
	4-23	PSKR-A004URP0	U	Air separate angle C	1	AC
	4-24	PSKR-A005URP0	U	Air separate angle D	2	AM
	4-25	PSLDHA001URP0	U	Rear heat cover	1	AM
	4-26	LANGQA018URP0	U	Convection heater angle A	1	AM
	4-27	PFPF-A002URE0	U	Heat insulating material	1	AL
	4-28	PSKR-A006URP0	U	Air separate angle E	1	AC
Δ	4-29	PSKR-A007URP0	U	Air separate angle F	1	AC
	4-30	NFANMA011WRP0	J	Convection fan	1	AD
	4-31	PHOK-A002URF0	U	Latch hook	1	AG
	4-32	PDUC-A016URF0	U	Fan duct	1	AL
	4-33	NFANJA038WRE0	U	Fan blade	1	AF
	4-34	GCOVHA002URP0	U	Bottom heater cover	1	AH
	4-35	LANGFA001URP0	U	Chassis support	1	AH
	4-36	NCPL-A040WRE1	U	Coupling	1	AP
	4-37	PCOVPA309WRE0	U	Waveguide cover	1	AC
	4-38	PFPF-A003URE0	U	Heat insulating material	1	AM
	4-39	PFILWA001URP0	U	Lamp filter	1	AB
	4-40	PPACGA101WRE0	U	O-ring	1	AB
	4-41	PSLDHA002URP0	U	Heater cover right	1	AM
	4-42	PSPAGA001WRE0	U	Vibration proof cushion	1	AA
	4-43	LBNDKA111WRP0	U	Capacitor holder	1	AD
	4-44	PSKR-A308WRF0	U	Rear barrier	1	AH
	4-45	LANGFA002URP0	U	Cavity support angle	1	AG

DOOR PARTS

Δ	5- 1	CDORFS013URK0	U	Door panel assembly [R-933(IN)]	1	BN
Δ	5- 1	CDORFW015URK0	U	Door panel assembly [R-933(W)]	1	BN
	5-1-1	GCOVHA024URF0	U	Choke cover	1	AL
Δ	5-1-2	DDORFA001URK0	U	Door panel	1	BH
Δ	5-1-3	GWAKPS020URR0	U	Door frame [R-933(IN)]	1	AT
Δ	5-1-3	GWAKPW031URF0	U	Door frame [R-933(W)]	1	AT

PARTS LIST

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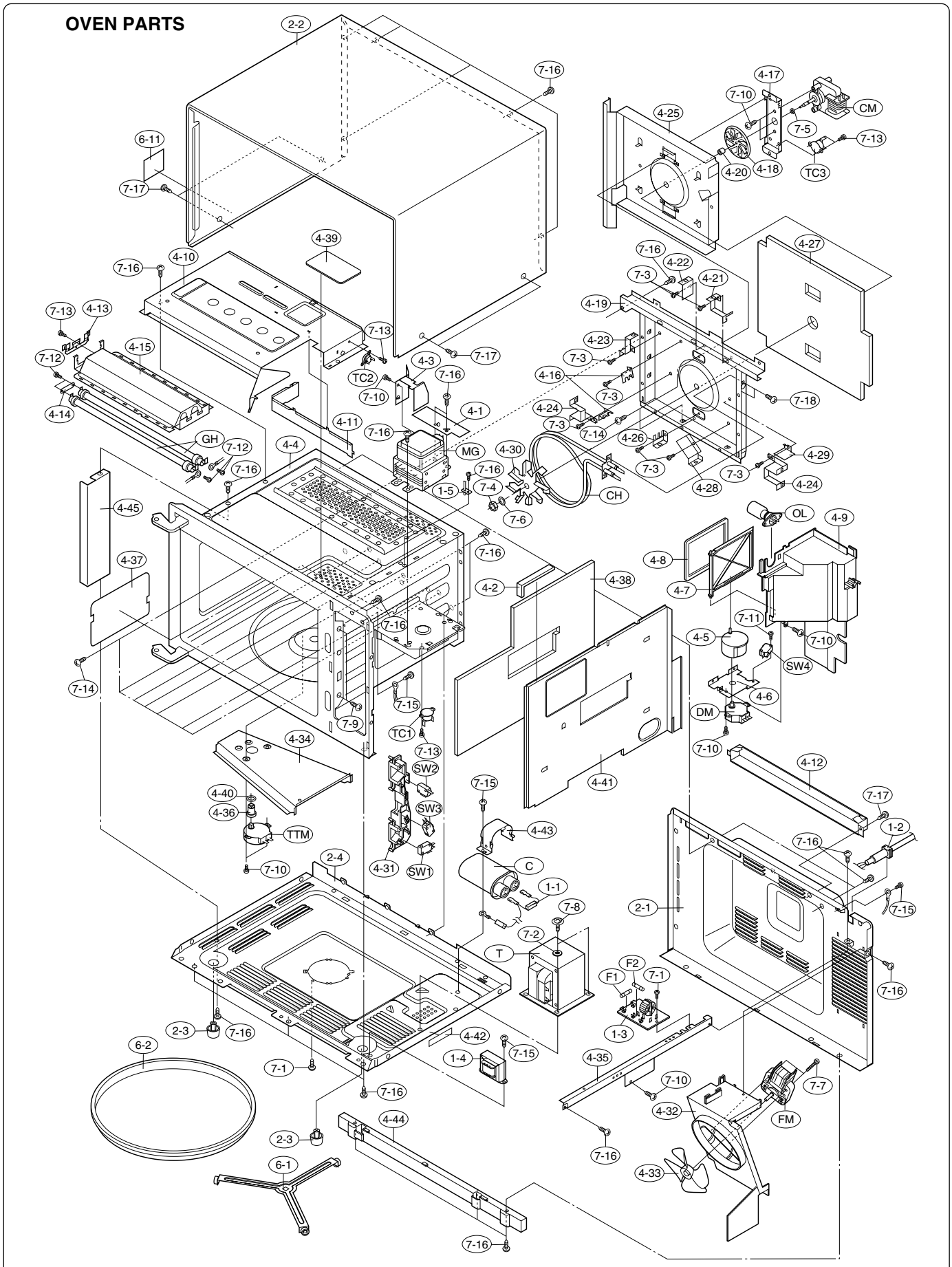
	REF. NO.	PART NO.	§	DESCRIPTION	Q'TY	CODE
	5-1-4	JHNDPK001URF0	U	Door handle [R-933(IN)]	1	AR
	5-1-4	JHNDPS001URT0	U	Door handle [R-933(W)]	1	AD
	5-1-5	LSTPPA017URF0	U	Latch head	1	AG
	5-1-6	MSPRTA197WREZ	U	Latch spring	1	AC
	5-1-7	PGLSPA023URR0	U	Front door glass [R-933(IN)]	1	AW
	5-1-7	PGLSPA022URR0	U	Front door glass [R-933(W)]	1	AW
	5-1-8	XEBSD30P06000	U	Screw : 3mm x 6mm	9	AA
	5- 2	LSTPPA018URF0	U	Door stopper	1	AB
				MISCELLANEOUS		
	6- 1	FROLPA060WRK0	U	Roller stay	1	AS
	6- 2	NTNT-A040WRE0	U	Turntable tray	1	AZ
	6- 3	PSRA-A025WRP0	U	Baking tin	1	AS
	6- 4	FAMI-A001URK0	U	High rack	1	AQ
*	6- 5	FAMI-A002URK0	U	Low rack	1	AP
	6- 6	TINS-A209URR0	U	Operation manual	1	AM
	6- 7	TCADCA012URR0	U	Cook book	1	AX
	6- 8	FW-VZA073URE1	U	Main harness	1	AW
	6- 9	FW-VZA074URE1	U	Stop switch harness	1	AH
	6-10	QW-QZA001URE0	U	High voltage wire B	1	AE
	6-11	TCAUHA006URR0	U	Caution label	1	AE
	6-12	TINS-A213URR0	U	Quick start guide	1	AC
	6-13	TLABMA139URR0	U	Menu label	1	AC
	6-14	LHLDKA008WRF0	U	P-clip	1	AA
				SCREWS,NUTS AND WASHERS		
	7- 1	XHPSD40P08K00	U	Screw: 4mm x 8mm	1	AA
	7- 2	XWWSD50-06000	J	Washer: 5mm x 0.6mm	1	AA
	7- 3	XCBWW30P06000	J	Screw: 3mm x 6mm	8	AB
	7- 4	XNEUW40-32000	J	Nut: 4mm x 3.2mm	1	AA
	7- 5	XRESE40-06000	U	Ring	1	AA
	7- 6	XWSUW40-10000	J	Washer: 4mm x 1.0mm	1	AA
	7- 7	XEPSD40P25000	J	Screw: 4mm x 25mm	2	AA
	7- 8	XFPSD50P10KS0	U	Screw: 5mm x 10mm	2	AC
	7- 9	XJPSD40P10X00	U	Screw: 4mm x 10mm	2	AA
	7-10	XHPSD40P06000	J	Screw: 4mm x 6mm	8	AA
	7-11	XEPSD30P14000	U	Screw: 3mm x 14mm	1	AA
	7-12	XBPWW30P05K00	J	Screw: 3mm x 5mm	4	AA
	7-13	XEBSD30P06000	U	Screw: 3mm x 6mm	5	AA
	7-14	XOTWW40P06000	J	Screw: 4mm x 6mm	9	AA
	7-15	XHTSD40P08RV0	J	Screw: 4mm x 8mm	4	AA
	7-16	LX-CZA001URE0	U	Special screw	27	AA
	7-17	XOTSE40P10000	J	Screw: 4mm x 10mm	5	AA
	7-18	XHTWW40P08000	J	Screw: 4mm x 8mm	2	AC

HOW TO ORDER REPLACEMENT PARTS

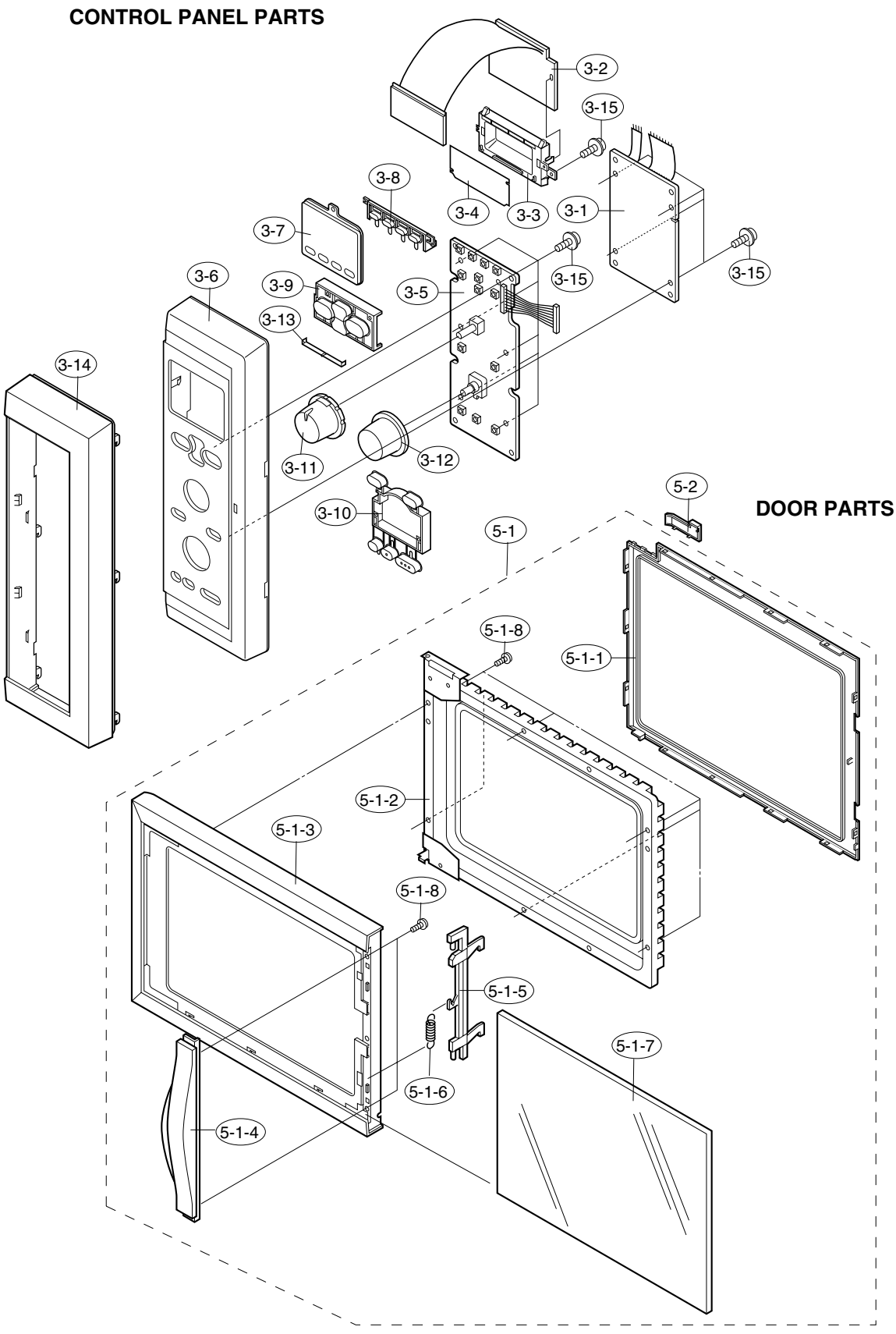
To have your order filled promptly and correctly, please furnish the following information.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION

EXPLODED VIEW OF OVEN

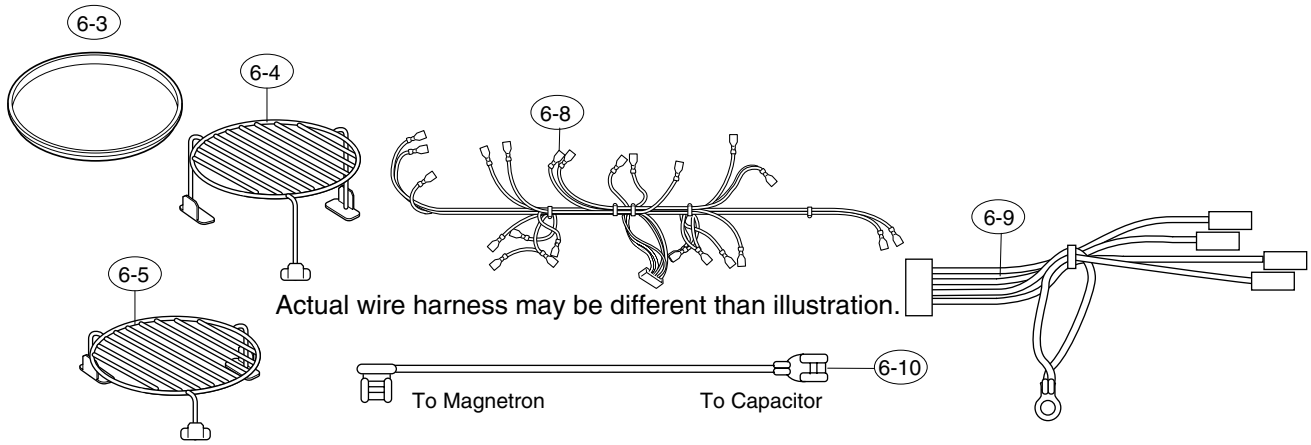


CONTROL PANEL AND DOOR PARTS

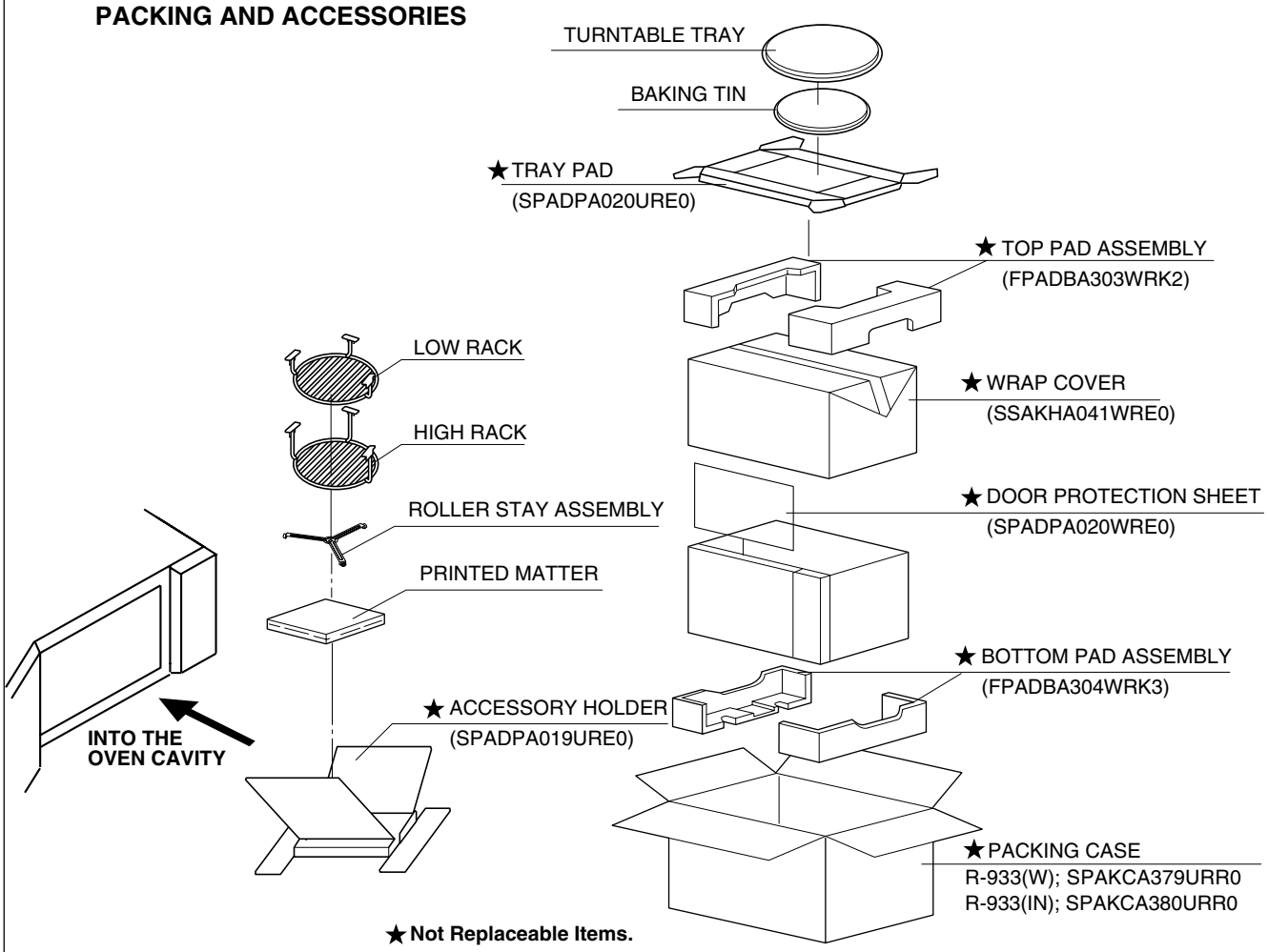


MISCELLANEOUS/PACKING AND ACCESSORIES

MISCELLANEOUS



PACKING AND ACCESSORIES



★ **Not Replaceable Items.**

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